

# Compendium of Applications for Honorees - 2019



With Support From



## Introduction

In its fourth year, the partnership of water sector organizations - the National Association of Clean Water Agencies (NACWA), the Water Environment Federation (WEF), the Water Research Foundation (WRF), and the Water Reuse Association – with input from the U.S. Environmental Protection Agency (EPA) – proudly announce the 2019 Utility of the Future Today (UOTF) Recognition Program recipients. Information regarding these organizations is provided in Appendix A.

The 2019 program celebrates the exceptional performance of 43 public and private water resource recovery facilities from the U.S. and abroad selected by a peer committee of utility general managers and executives for innovation in community engagement, watershed stewardship, and the recovery of resources such as water, energy, and nutrients. The applications of these recognized utilities are provided to document their efforts and to be a resource for prospective applicants. Recipients of the UoTF Today recognition are encouraged to share information regarding best practices, and to be a resource to other utilities.

The 2019 recipients were recognized at an UoTF Today awards ceremony held at WEFTEC 2019 in Chicago. Awardees received a UoTF Today banner and a certificate of recognition to further identify and promote their outstanding achievement as a Utility of the Future Today.



The UOTF concept was introduced in 2013 to guide utilities of all sizes toward smarter, more efficient operations and a progression to full resource recovery with enhanced productivity, sustainability, and resiliency. Since then many utilities have successfully implemented new and creative programs to address local water and wastewater issues as well as related community challenges. The UoTF Today Recognition Program seeks applications from domestic and international water systems that are transforming operations through technology, communication and innovative solutions and that have performance-based results.

Innovation and technology are foundational criteria for this recognition and are the basis for providing a distinction between well-run utilities and those going beyond traditional operational practices toward visionary performance.

Since 2016, the partnership has honored 118 utilities meeting the criteria of the UOTF Today Program. The partnership will continue to seek organizations that build on their success by celebrating their advancements and experiences, and by encouraging the adoption of the UOTF principles which enable organizations across a broad range of capacities and capabilities to collaborate, learn and continue to evolve as a unified sector. Additional background and historical information regarding the UoTF Today program is provided in Appendix B.

The 2020 UoTF Today program is scheduled to launch in March 2020, at which time information regarding applying will be available online.

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## Program Statement of Purpose

The Utility of the Future Today Recognition Program seeks to reach deeply into the water sector to form and motivate a community of like-minded water utilities engaged in advancing resource efficiency and recovery, developing proactive relationships with stakeholders, and establishing resilient, sustainable, and livable communities. The Recognition Program, through the aggregation and sharing of utility advancements and experiences, enables participants across a broad continuum of capacities and capabilities to learn from each other and continually grow and sustain their efforts to be, and continually advance the concept of, the Utility of the Future.

The Recognition Program seeks to encourage utilities to embed the principles of the Utility of the Future within their organization, beginning with Organizational Culture which is the foundation by which all seven of the Utility of the Future Activity Areas are sustainably supported:

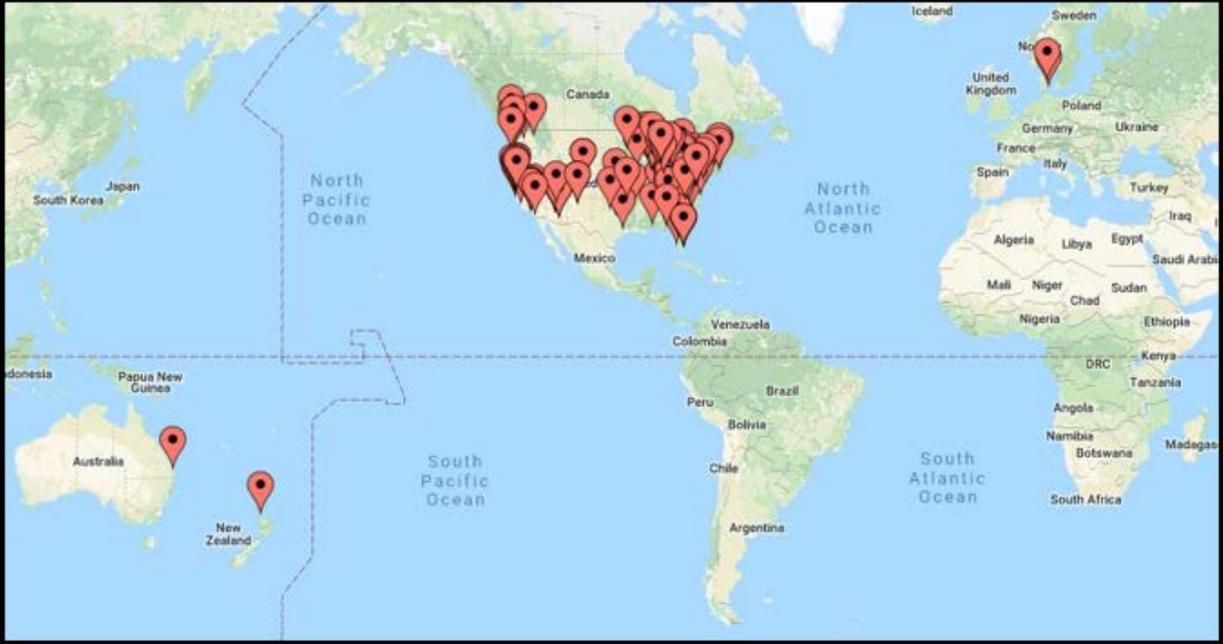


Utility of the Future Today Activity Areas:

- Beneficial Biosolids Reuse
- Partnering and Engagement
- Energy Efficiency
- Energy Generation and Recovery
- Nutrient Reduction and Materials Recovery
- Water Reuse
- Watershed Stewardship

Utilities receiving recognition through this program are encouraged to share their practices and experiences to create a community of practice around the Utility of the Future Today, and to enable other utilities to continually learn from each other and evolve as a sector.

**118 Utilities of the Future Today after four years of program implementation**



# Utility of the Future Today Honoree Applications for 2019

## Albuquerque Bernalillo County Water Utility Authority, NM

### Partnering & Engagement



### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: Albuquerque Bernalillo County Water Utility Authority		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Single Water Reclamation Plant with collection system		
Service Area (square miles): 199	Average Annual Daily Flow or Demand (MGD): 49.76	
Population Served: 681,000		
Location		
Street Address: One Civic Plaza NW, Room 5012		
City: Albuquerque, NM	State:	Country: USA
Zip Code/Country Code: 87102		
Utility Representative Contact Information		
Name: Mark S. Sanchez	Phone: 505-289-3101	Email: msanchez@abcwua.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.		
<input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <input checked="" type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship		

## Application Part 2: Organizational Culture

The Albuquerque Bernalillo County Water Utility Authority (Water Authority) has established a culture of organizational excellence that has created positive change in the management of the utility. It has adopted the tenets of Effective Utility Management and fostered continuous performance improvement to achieve its vision, mission and long-term goals. The utility has committed to improving communication with its stakeholders by engaging its employees and customers and has taken steps to create a culture of creativity and collaboration.

### Effective Utility Management

In 2011, the Water Authority began integrating the Effective Utility Management (EUM) framework into its strategic business planning and performance management processes. In addition to measuring its performance using a set of water and wastewater industry indicators, the Water Authority also incorporates the recommended measures from the EUM Primer.

Since 2013, the utility has produced EUM Quarterly Reports containing 42 key performance indicators to measure the progress in each EUM Attribute area and identify gaps in performance. The utility then develops performance targets to address the gaps through metric and process benchmarking. These performance targets are measured against the desired outcomes expressed in the vision, mission and long-term goals as a way of gauging the organization's effectiveness in achieving its objectives. Besides systematizing the utility's performance management efforts, this process also provides a framework for communicating to stakeholders how the utility establishes its priorities and financial resources.

The Water Authority also uses the EUM Benchmarking Tool as part of its continuous performance improvement process. The EUM Benchmarking Tool, developed from Water Research Foundation Project 4313, allows the utility to create a customized self-assessment containing only the relevant attributes, practice areas, and performance measures identified by the utility. The utility conducts a self-assessment on all 10 EUM Attributes every two years. The Benchmarking Tool has helped greatly in facilitating internal discussions regarding performance and in obtaining input from a cross-section of staff on performance improvement in updating the utility's Goals and Objectives.

### Training

The Water Authority has demonstrated its commitment to employee development in several different ways. On the training front, several new certification programs have been developed in the past five years in utility maintenance, customer care, and AMI/meter maintenance. The utility also has developed

its own certification training program for entry-level utility operators that allows them to progress to Journeyman level and obtain State certification without having to seek outside instruction. Through this program, the Water Authority strives for all operators to achieve at least Journeyman level status. Safety training, meanwhile, has received greater emphasis with the addition of safety instructors, the hiring of an outside safety consultant to review utility practices and procedures, and the inclusion of a safety overview in employee onboarding.

One of the major achievements for the utility was the reduction of injury time, which has been reduced by almost 100% over the past ten years. The Water Authority initially developed safe-work incentives, conducted routine employee safety training, and modified its light duty program. This process provided a clearer understanding on what needs to take place when an injury occurs including the documentation, payroll coding and expectations and potential reassignment of the employee to light duty. To encourage employees to reach its performance targets, the utility awarded every employee with \$300 incentive payments when employees achieved injury reduction goals.

### **Leadership Development**

The Water Authority has also implemented several leadership development initiatives. The utility participates in the AWWA/WEA Rocky Mountain Section Supervisory Leadership Certificate Program by sending several of its supervisor-level employees to this program to improve their leadership skills, network with peers, and develop their professional and personal growth. In addition, every year two members of upper-level management attend the Water and Wastewater Leadership Center. More recently, the Executive Director has created a leadership team to evaluate performance gaps and develop strategies realized through the EUM Benchmarking Tool self-assessment as a part of its continuous improvement program.

### **Knowledge Management**

The Water Authority has developed several workforce development strategies to transfer key explicit and tacit knowledge to those in line to succeed retiring employees. The Knowledge Management Strategy (KMS) is aligned to the utility's Asset Management Plan in that it focuses on asset-centered knowledge. The KMS identifies who possesses the critical knowledge, where this knowledge is being held, and who is using this information to make decisions. Another key component in retaining knowledge was updating standard operating procedures and storing them in a central location accessible through the employee portal and the CMMS.

### **Employee Involvement and Recognition**

The Water Authority conducts a biennial employee satisfaction and engagement survey. Survey results showed that the utility needed to focus on its recognition, engagement, and internal communication. The utility developed steering committees to address these areas and identify strategies and improvements. In 2016, the recognition program was rebranded and expanded, named Authority STARS (Service, Teamwork, Attitude, Respect, Safety). The program actively encourages, develops, and rewards performance and dedication that exceeds normal expectations. Numerous awards have been provided to employees across the organization for efforts ranging from the development of customized software for vehicle and fleet repair history to the design of a centrifuge cleaning apparatus that has reduced the cleaning time from several hours to 20 minutes. To increase the diversity of awardees supervisors are regularly trained on the various awards and proper award presentation tactics. STARS provides for quarterly awards designed to reward employees with monetary and/or administrative leave presented at the governing board meeting. The program also includes on-the-spot recognition and group teamwork accomplishments.

Following up from the 2017 employee survey, Employee Connections was developed to help improve employee engagement. In this program, employees were randomly selected to participate in four meetings to provide critical feedback to improve the work climate of the organization. This feedback was

used to develop supplemental appreciation and communication programs through the existing training programs.

### **Employee Expectations**

The most significant change to employee development has been the implementation of an Employee Expectations program, a formal performance review mechanism designed to better align employee performance to the overall goals and core values of the Water Authority. This alignment has helped to educate employees about the utility's core values, goals and annual objectives. It has engaged employees by demonstrating to them how their work fits into the "big picture" of utility goals and objectives. By linking employee performance to the success of the utility, Employee Expectations promotes accountability and opens up opportunities for dialogue about work expectations among supervisors and employees.

## **Application Part 3: Activity Area - Partnering & Engagement**

### **Overview**

Stakeholder communication plays a significant role in promoting buy-in and acceptance from customers as the Water Authority adopts new plans, policies, and programs. The Customer Conversations program was developed to engage its customers through topic forums four times per year to maintain an ongoing conversation with its customers on important issues facing the utility.

### **Background and Context**

The Water Authority has historically had a good relationship with its customers and has taken care to educate them on critical issues. These outreach efforts, while successful, were limited in scope and focused on specific programs. There was not a consistent, ongoing discussion with customers regarding the broad scope of the utility's policies and mission. To address this, the Water Authority developed Customer Conversations to generate ongoing public input regarding the utility's plans, policies, and programs. This program has helped the utility to better fulfill its achievement in the EUM attribute of Stakeholder Understanding and Support. Moreover, by reviewing these proposals with its customers allows for better buy-in from the utility's governing board when considering budgets, rate adjustments, capital improvement programs, and risk management decisions.

### **Process**

A steering committee established to oversee the development and implementation of the four scheduled meetings each year. Staff utilized the 2011 guidance document "Assessing Customer Preferences and Willingness to Pay" from the Water Research Foundation on how to plan and conduct focus groups. The Water Authority was a participating utility in this research and was used as a case study. The Water Authority hired a facilitator to assist in the planning, organizing, and facilitating of the four meetings. The Senior Policy Manager coordinated the planning and implementation process including program development, staff collaboration, contract administration, meeting and venue planning, customer recruitment, registration and communications, data analysis, and report development.

To recruit customers to these meetings, staff utilized email with e-bill customers, the website, e-newsletter, and the NextDoor neighborhood social network. Each participant received a \$20 credit on their water/sewer bill for attending the meeting. A confirmation letter was sent to pre-registered customers a week before the meeting to confirm their registration and as a reminder to attend the event. Annually, about of 200 customers attend the Customer Conversation meetings with an average attendance of 50 per meeting. The meeting attendance and participation exceeded staff expectations and showed the governing board the level of engagement from customers on important topics facing the utility.

The utility's Technical Customer Advisory Committee (TCAC) hosts each meeting with members attending these meetings to observe the process and listen to customer comments. The TCAC is a nine-member committee of volunteer customers with technical expertise aligned to the utility's mission and

long-range goals. Their attendance is consistent with its mandate but also gives members an opportunity to hear from customers who would not otherwise attend a public meeting.

### **Innovative & Interactive Engagement**

The Customer Conversations program features innovative and interactive sessions intended to educate and inform while also soliciting ideas and opinions. Staff provide short presentations but spend most of the “conversation” allowing the customers to discuss the issues in a round-table format with facilitators and recorders at each table. The discussions are guided by staff-developed activities to draw customers into the discussion and to allow for full participation. Through the Customer Conversations meetings, the utility can educate its customers on current and future challenges and obtain input using interactive activities to help customers understand the issues and adequately provide feedback. Customer feedback is used to make changes to policies, plans and programs. After each forum, a final report is created and shared with participants and is available on the Water Authority’s website ([www.abcwua.org/customer-conversations.aspx](http://www.abcwua.org/customer-conversations.aspx)) so that customers can review the meeting outcomes and understand how the information will be used. Some examples of topics covered during these forums include infrastructure renewal, the rate structure, source water protection, long-term water supply needs, climate variability, water quality and service levels.

### **Summary Table of Key Take-Aways**

Implementation Issues and Lessons Learned	Key Outcomes / Benefits	Remaining Challenges	Resources
<ul style="list-style-type: none"> <li>Hire recorders to record information on easels so participants can see comments recorded</li> <li>Post final report on website and alert participants of the report availability</li> <li>Create online registration and provide follow-up confirmation</li> <li>Cover only one to two topics</li> <li>Allow plenty of time for discussion</li> </ul>	<ul style="list-style-type: none"> <li>Frequent engagement with customers on a quarterly process</li> <li>Provides two-way conversation and education component</li> <li>Engagement program that obtains input from “rank and file” customers, not just “frequent fliers”</li> <li>Customers enjoy meetings: feel time well spent, would participate again, meeting structure allowed for feedback</li> </ul>	<ul style="list-style-type: none"> <li>Better involvement from customers in 30s – young families difficult to reach because of time constraints</li> <li>Engage governing board to attend at least one meeting</li> </ul>	<ul style="list-style-type: none"> <li>Staff time</li> <li>Lead facilitator contract</li> <li>Activity materials</li> </ul>

### **Partnering & Engagement Activity Performance Measures**

Measure What are you measuring?	Targets What was your goal/intended outcome?	Outcomes What were your actual outcomes?
Customer Satisfaction	Overall satisfaction (very/somewhat) with service provided by the Water Authority. Target is 90%.	From the Biennial Customer Opinion Survey, target met last twelve years
Media Coverage Tone	Percent of positive or neutral media stories concerning the utility. Target is 90%.	Met target last four years; continuously improving.
Customer Outreach	Monthly mailed communications to all customers via bill inserts Monthly electronic newsletter to all customers who participate in e-billing	Improve the Water Authority’s perception among customers and other stakeholders and maintain public confidence in the safety of the municipal

	Weekly updates to customers via Facebook page Periodic news alerts via Nextdoor	water supply and water and wastewater infrastructure. All targets have been met.
Customer Conversation Meeting Evaluation	Ratings from customers participating in Customer Conversation meetings on a scale of 1 to 5 with 5 the highest. Target is 4.5 or higher.	Score ranges from 4.5 to 4.8 in last six years. Customers rate on time well spent, input wanted, participate again, meeting facilitated feedback
Low-Income Billing Assistance	Number of households receiving low-income assistance bill credit. Target is 1,000 households by 2020.	Since partnering with two non-profit organizations to administer the program in 2017, the number of households has increased by 37% and target is at 70% of goal.
Education Program	Number of students educated through classroom presentations and river or plant tours. Target is over 20,000 students per year.	Program goal is to inform and inspire students to conserve water and protect limited water resources. Target met in last five years.
Source Water Protection Partnership	Number of acres of forest land restored through Rio Grande Water Fund	Goal of this partnership program is to restore 600,000 acres of forest land by 2034 through thinning, controlled burns, and stream erosion mitigation. Target of 30,000 acres met in last three years.
Beneficial Tree Canopy Coverage Partnership	Planting trees in city and county parks using efficient watering practices. Target is 2,000 mixed tree species by 2027.	Due to drought, disease and age, there has been significant decrease in tree canopy. This program establishes a healthy, sustainable tree canopy in public spaces. Target is 25% complete.

# Broward County Water and Wastewater Operations North Regional Wastewater Treatment Plant and Collection System, Fl

## Energy Regeneration and Recovery



### Application Part 1: Background Information

<b>Utility Description (combine all plants if a multi-site system)</b>	
Utility Name: Broward County Water and Wastewater Operations – North Regional Wastewater Treatment Plant	
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional Wastewater Plant and Collection System	
Service Area (square miles): 41	Average Annual Daily Flow or Demand (MGD): 69
Population Served: Approximately 650,000	
<b>Location</b>	
Street Address: 2401 N. Powerline Road	

City: Pompano Beach	State: FL	Country: USA
Zip Code/Country Code: 33069		
<b>Utility Representative Contact Information</b>		
Name: Mark Darmanin	Phone: 954-831-0960	Email: mdarmanin@broward.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b>		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? N/A		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.		
<input type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>1</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>2</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>3</sup> ( <input type="checkbox"/> IGP)		

### Additional Background Information

The Broward County Water and Wastewater Operations Division (WWOD) owns and operates the North Regional Wastewater Treatment Plant (NRWWTP), which has provided contract wholesale wastewater services to Large Users plus the County since 1974. The current Large Users include the Cities of Coconut Creek, Coral Springs, Deerfield Beach, Lauderhill, North Lauderdale, Oakland Park, Pompano Beach and Tamarac; and, North Springs Improvement District (NSID), Parkland Utilities, and Royal Utilities. Service is also provided to Districts 1 and 2 retail wastewater systems. The NRWWS includes 11 master pumping stations and approximately 66.3 miles of force mains. All the wastewater collected from retail Districts 1 and 2 and Large User customers are treated at the NRWWTP located in Pompano Beach, Florida. The plant has a permitted treatment capacity of 95 MGD of which 87.015 MGD has been reserved by the Large Users and the County. During Fiscal Year 2017, the annual average daily flow rate at the NRWWTP was approximately 71.7 MGD, and the plant currently has sufficient capacity to meet the projected demands of all Large Users and the County to at least the year 2035.

### Application Part 2: Organizational Culture

The Broward County Water and Wastewater Operations Division (WWOD) mission statement includes the words “**reliable, quality, safe, efficient, and cost-effective**”.

<sup>1</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>2</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>3</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

These words are the pillars of the culture. As a utility in operation for over 50 years, Broward County WWOD has had one of the lowest rate structures while managing to fund a healthy Capital Improvement Program (CIP). This has allowed the utility to address infrastructure issues proactively. The Utility uses the “band-aid” approach, fund the operating budget appropriately, keep it running now, document the need for future replacements, appropriately fund the CIP program, and execute the CIP program. The utility has been able to retain what has been proven to work overtime, while increasing reliability and process optimization. The organization is notably “no frills”, always looking for ways to keep ratepayer costs low, while investing in what matters: safety, staff training and development, infrastructure renewal, and system upgrades for efficiency and process improvement.

The Utility has a sense of community; helping other utilities after natural disasters, participating in fund raising events to help local charities and those in need, and providing outreach to area school children. The sense of community is also evident within the utility, as long-time employees train new staff and encourage them to be excellent technically and as team members. New talent shares their expertise and skills with long-time employees, providing an influx of new ways to improve current operations and processes. Broward County also provides apprenticeship positions in order to develop “homegrown” talent. Because it is understood that people learn in different ways and at different rates, this organization encourages individual training plans and methods. The individual is valued more than just the work produced.

This Utility of the Future Today has a culture of strength and resiliency by remembering the Utility of the past. The Utility uses best management practices and tools such as an aggressive asset management system, GIS, SCADA, system evaluations/inspections, preventive system maintenance, capital projects planning and hydraulic modeling. Over the years Utilities have learned the components required for effective and efficient operation. Broward County Water and Wastewater Operations focuses on product quality, customer satisfaction, employee and leadership development, operational optimization, financial viability, infrastructure strategy and performance, enterprise resiliency, community sustainability, water resource sustainability, and the development of stakeholder understanding and support.

In an effort to remain proactive instead of reactive, the Utility maintains an awareness of upcoming legislative and regulatory requirements, and new scientific/technical knowledge. WWOD considers the climate change impacts and energy conservation practices in daily operations and construction projects. The Utility works diligently to minimize environmental impacts, for example the construction and operation of a cogeneration facility which recovers methane and turns it into electricity which is then used to power approximately 20 percent of the NRWTP.

The infrastructure, processes, and technology are nothing without the qualified and dedicated people to make them happen. The Utility of the Future is only as good as the people you have today, and the vision they translate into reality.

### **Application Part 3: Activity Area - Energy Generation & Recovery**

#### **1. Overview Paragraph**

Broward County installed an Energy Cogeneration system at the North Regional Wastewater Treatment Plant in 2015 to take advantage of the electrical power generation ability of the Wastewater Plant’s anaerobic digesters methane production. When directly fed with used Fats, Oils and Grease (FOG), the Cogen system produces electricity to reduce the reliance on purchased electricity to operate plant processes and provides heat for the mesophilic digesters. Since the system performs better with direct introduction of oils and grease into the digesters, most of the FOG is no longer processed through the wastewater secondary aeration process, but is instead diverted from the Septage Receiving Facility to the Digesters. This diversion, through a new injection point, results in a better quality biogas for energy production and results in a processing cost savings for the FOG. The installation of the power and heat generation project to minimize waste, increase reliability, increase efficiency, and minimize greenhouse

gas emissions and carbon footprint, is an example of Broward County's commitment to good stewardship and green operations. The program is expected to reduce greenhouse gas emissions by 8,893 metric tons annually and offset the purchase of utility power by at least 20%.

## 2. Question & Answer

a. How did you go about Implementing the practice/activities/programs that you described in your Overview paragraph?

Broward County began investigating this process in 2011. This initiative was part of the County's strategies toward reducing carbon emissions to 1997 levels by 2015. Working with Chevron Energy Solutions (now known as ENGIE Services U.S.), Broward County determined that implementation of the Cogen system was financially viable and supported sustainability and reliability initiatives.

b. What type and amount of resources were needed to support implementation (e.g., financial, staff, other)?

Financial resources were necessary for the installation of a 2-megawatt engine generator with gas cleaning facilities, and the construction of a FOG receiving station near the digesters at a cost of approximately \$20 Million each. One position was redirected to operate and maintain the on-site FOG station.

c. Did you partner with other stakeholders or organizations as part of your implementation process?

In addition to working with stakeholders, Broward County partnered with ENGIE Services U.S., OpTerra Energy and Hazen and Sawyer on this initiative.

d. What was the most critical obstacle that your utility had to overcome to be successful in this Activity area, and how did you do that?

One of the biggest challenges was determining the correct amount of FOG to add to the digesters during startup to avoid stressing the digester microbes and falling below recommended alkalinity levels. This was achieved through rigorous testing in coordination with Hazen and Sawyer. Another challenge was encouraging FOG drivers to use the new delivery point and to avoid comingling other waste streams with the FOG. This was achieved through an outreach program to those affected.

e. Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

Broward County collects data automatically from a Data Acquisition System and uses the Supervisory Control and Data Acquisition (SCADA) system to transmit the data to servers for processing and storage. Internal data systems are also used to track FOG delivery sources and volumes. Automatic alarm systems are used to monitor operations and provide alerts when process limits are out of range.

f. Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Additional information about this project can be found on the ENGIE webpage at [www.engieservices.us](http://www.engieservices.us) and on the Hazen and Sawyer webpage at <https://www.hazenandsawyer.com/publications/getting-an-energy-boost-from-co-digestion-through-esco-project-delivery/>. The June 2017 edition of the Florida Water Resources Journal published an article on this project titled "Lessons Learned from Start-Up of a Codigestion Process."

## 3. Performance Measures & Results:

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes* What were your actual outcomes?</b>
Electric Production Savings	25%	15,205,288 kWh (approx. 24%)
Electrical Cost Savings	\$1,167,368	\$1,167,458

\*ENGIE Services U.S. Inc., May 15, 2018 Year 1 Final Report, using Feb 2017 – Jan 2018 Data

# Camden County Municipal Utilities Authority, NJ

## Partnering and Engagement



### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: Camden County Municipal Utilities Authority		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional system		
Service Area (square miles): 226	Average Annual Daily Flow or Demand (MGD): 58	
Population Served: 500,000		
Location		
Street Address: 1645 Ferry Avenue		
City: Camden	State: NJ	Country: United States
Zip Code/Country Code: 08104		
Utility Representative Contact Information		
Name: Andrew Kricun	Phone: 856-583-1223	Email: Andy@ccmua.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
Current Program Members Only		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		

In what year did the utility achieve recognition as a Utility of the Future Today?  
2016

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>4</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>5</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>6</sup> ( IGP)

## Application Part 2: Organizational Culture

The Camden County Municipal Utilities Authority (CCMUA) is dedicated to fostering a strong organizational culture throughout the utility, an approach CCMUA has promoted widely through industry forums. The CCMUA takes a multi-pronged approach to achieve this culture including the use of an environmental management system, employee training, employee engagement and community and stakeholder engagement.

The core values of the CCMUA are described in its environmental management system which combine the criteria of the National Biosolids Partnership and the ISO 14001 standards into a comprehensive blueprint for achieving a triple bottom line solution to the water based environmental challenges and opportunities that are present in Camden County, NJ. The core values are as follows:

- Optimizing water quality performance.
- Optimizing odor control performance.
- Maximizing cost efficiencies for the benefits of our ratepayers, without sacrificing environmental performance.
- Reducing the CCMUA carbon footprint, and our corresponding vulnerability to climate, change by increasing resiliency.
- Community Service
- Upholding the Code of Good Practice for biosolids developed by the National Biosolids Partnership.

These core values are understood at every level of the CCMUA organization and almost all activities of the CCMUA are in support of them. This utility wide commitment allows for the management staff to create discrete goals and milestones around these values that are evaluated on an ongoing basis. The result of this system-based approach has led to the continuous improvement of the CCMUA.

Employee Training is integral to the success of the CCMUA. Wastewater treatment plant and pump station operators and maintenance personnel undergo technical training and education as well as occupational health and safety training on an ongoing basis. The result of this training is that 100% of senior and supervisory job openings have been filled with in-house candidates over the past three years. Further, the CCMUA's next generation of leaders have engaged in a training program with future leaders

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<sup>4</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>5</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>6</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

from the Philadelphia Water Department and Atlantic County Utilities Authority for each of the past two years through a NACWA endorsed Building Utility Leaders of the Future program. The 8 graduates of the program have not only developed leadership skills but have created peer-to-peer relationships in which information is shared across the utilities. As many long-time staff approach retirement age, CCMUA is also undertaking a program to electronically retain institutional knowledge for young workers.

The Executive Staff of the CCMUA engages with the operational and administrative staff in several ways including all-employee meetings, individual meetings, technical/operational meetings, project planning meetings and environmental management system meetings.

-All-employee meetings allow for the senior leadership to convey the goals and values of the Utility as well as to report back on how key performance indicators compare to those goals. Employees are encouraged to offer thoughts and feedback.

-Collectively, the senior leadership staff at the CCMUA has an open-door policy and encourages individual employees to reach out and discuss opportunities for improvement, ways to solve specific problems or any other idea that would benefit the Utility.

-The senior leadership staff meets with the senior and supervisory technical/operating staff to discuss and find solutions to inefficiencies as well as to discuss any idea that would support the core values and goals of the Utility.

-Project planning meetings are a chance for staff members to discuss the implementation of new ideas or projects that can allow for the continual improvement of the Utility.

-Environmental management system meetings allow for the staff to evaluate, via internal audits, how the utility is operating compared to its values and goals and how the system-based approach to continuous improvement is serving the Utility.

Community and Stakeholder engagement is an integral part of the of CCMUA's mission. First and foremost, because of the proximity of the CCMUA's wastewater treatment plant to a residential neighborhood (about 100 yards), the CCMUA has a zero-tolerance policy towards odors. Every employee is tasked with contributing to meeting this goal by constantly being on "patrol" for odors. The CCMUA has not had an odor complaint in more than a year.

The CCMUA's work is aimed at much more than not harming the community by eliminating odors. Instead, the CCMUA has taken steps to become an anchor institution in Camden City which is the location of the wastewater treatment plant. The CCMUA is a founding member and leader in the Camden Collaborative Initiative which is a group of more than 70 governmental, non-profit and business organizations that work together to address the environmental challenges and opportunities that exist in Camden. The CCMUA has also partnered with Camden City and a local non-profit to implement PowerCorps which identifies at-risk youth and provides them with job development skills and environmental training while they provide the service of maintaining over 50 green infrastructure sites that were installed by the CCMUA and the Camden Collaborative Initiative in an effort eliminate combined sewage flooding in the City by 2020. Three graduates of PowerCorps are now employed as CCMUA staff.

For decades, the residents of Camden City have not had access to the waterfront of three rivers and creeks that surround the City. In recent years, CCMUA has worked to restore access by opening 4 waterfront parks totaling more than 50 acres. In addition to providing access to the residents, the parks serve as much needed recreation areas and absorb significant amounts of storm water on an annual basis.

By identifying community service as a core value of the CCMUA and working to accomplish discrete goals the CCMUA staff members are continually reminded that their public service directly impacts the health and wellbeing of the communities they serve.

### **Application Part 3: Activity Area - Partnering & Engagement**

Partnering is collaboration with stakeholders to enable the utility to meet its own Utility of the Future goals while also enhancing the overall environmental, economic, and social wellbeing of the stakeholders and the community at large. Partnering between utilities (peer-to-peer exchange), whether offering or seeking such opportunities to advance utility performance, including, but not exclusive to, Utility of the Future goals, falls into this activity area. Engagement is the interaction with customers and other stakeholders to provide ongoing opportunities for dialogue along with communication and education related to utility operations and the value of water and utility services. Through partnering and engagement, the utility proactively engages with stakeholders and community decision makers to promote the utility as a valued, competent, and trustworthy community asset.

The CCMUA has partnerships in place with over 70 organizations via the Camden Collaborative Initiative which is a group of governmental, non-profit and business organizations that work together to implement projects that help to address the significant environmental challenges and opportunities that exist in Camden City. The CCMUA regularly engages community groups, with the help of its non-profit partners like the Trust for Public Lands, when planning and designing water quality improvement projects in its service area. Each project the CCMUA undertakes has a triple bottom line approach in that the project must improve the environment, not have an increase to the user rate and provide a community benefit. The CCMUA meets on a monthly basis via working group meeting with community stakeholders, regulators and local officials. The CCMUA is a proponent of peer learning partnerships and is currently leading a peer-to-peer program for 13 wastewater utilities in New Jersey. The CCMUA offers extensive educational opportunities including the PowerCorps and Green Ambassador Program, wastewater treatment plant tours, cleanups at CCMUA parks and outreach at community events. The CCMUA maintains a strong web presence with its own website ([ccmua.org](http://ccmua.org)), the Camden Collaborative Initiative website ([camdencollaborative.com](http://camdencollaborative.com)) and Camden SMART website ([camdensmart.com](http://camdensmart.com)). Due to these and other similar programs, the CCMUA is positioned as an anchor institution in the community. CCMUA is also active in promoting peer-to-peer initiatives industry-wide in the statewide water sector community and international water sector organizations.

### **Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

The CCMUA has transformed itself from a utility that had a negative impact on the City/neighborhood in which it is located by not controlling odors to one that is an integral part of the environmental health of the City. Much of this work was accomplished by listening to the local stakeholders and community members and understanding what their needs were and how they could be addressed. After understanding the needs, the CCMUA worked, and continues to work, with local partners to develop strategies that address the environmental needs via a triple bottom line approach. The result of these partnerships are projects where experts in their field work with community stakeholders and the CCMUA to provide exceptional outcomes including enhanced funding opportunities. CCMUA's executive director also makes frequent public appearances in public forums to (webcasts, speeches, congressional testimony, etc.) promoting these principles.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

The resources needed to support implementation really come in three distinct forms. First, staff time is needed to meet with and understand the needs of the community stakeholders. For the CCMUA, this means that staff that are allocated for other core competencies (engineering, operations, financial,

administration) take time to engage. Second, the leadership of the CCMUA, including its Board of Commissioners, support the community engagement and specific projects that allow for beneficial environmental outcomes. Third, financial resources are allocated via the operating budget and for larger projects via the state revolving fund, The New Jersey Infrastructure Bank. It is important that all of the projects, from odor control to environmental education, have not resulted in a rate increase to the rate payers.

Did you partner with other stakeholders or organizations as a part of your implementation process?

Yes, the CCMUA has partnered with over 70 organizations via the Camden Collaborative Initiative to implement the projects and programs aimed at engaging the community. As a representation, the core team of the Camden Collaborative consists of the Environmental Protection Agency, the New Jersey Department of Environmental Protection, the City of Camden, Cooper’s Ferry Partnership (a local non-profit) and the CCMUA. Another representative example is the Camden SMART program which consists of the New Jersey Department of Environmental Protection, the City of Camden, Cooper’s Ferry Partnership, Rutgers University, the NJ Tree Foundation and the CCMUA.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

The most critical obstacle that the utility had to overcome was changing the internal paradigm of what a utility should be to the local community. As noted previously, constructing odor control facilities was the first attempt at addressing community needs. This was accomplished by demonstrating to the leadership that the CCMUA could have a positive effect on the lives of the community without impacting the user rate. From that project forward, community service became an important core value to the CCMUA.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Due to the nature of community engagement, “smart” information technology has not played a part in the CCMUA’s success in this area.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Other utilities can contact the CCMUA Executive Director, Andy Kricun, at [Andy@ccmua.org](mailto:Andy@ccmua.org) or by going to the following websites:

- [www.CCMUA.org](http://www.CCMUA.org)
- [www.CamdenCollaborative.com](http://www.CamdenCollaborative.com)
- <http://www.CamdenSmart.com>

**Performance Measures & Results:**

Measure What are you measuring?	Targets What was your goal/intended outcome?	Outcomes What were your actual outcomes?
Green Infrastructure Sites	50	65
Waterfront Parks Opened	4	4
Greened Acres	100	125
Stormwater Captured Annually	50,000,000	64,000,000
Awards/Formal Recognition	0	12
Educational Programs	1	4
Educational Program Alumni Hired	1	4

<b>Number of Active Utility-to Utility Partnerships</b>	5	15
<b>Odor Complaints</b>	0/year	0 in last year
<b>Partners in Camden Collaborative Initiative</b>	20	70
<b>Outreach Events Annually</b>	8	10
<b>Lead Awareness Videos Created</b>	1	3
<b>Lead Awareness Information Packets Distributed</b>	10,000	15,000

# Central Contra Costa Sanitary District, CA

## Partnering and Engagement



### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: Central Contra Costa Sanitary District (Central San)		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Single plant, 18 pump stations, and collection system		
Service Area (square miles): 182 (145 excluding wholesale wastewater treatment only service area)	Average Annual Daily Flow or Demand (MGD): 36.6	
Population Served: 488,900 (140,600 wholesale wastewater treatment only)		
Location		
Street Address: 5019 Imhoff Place		
City: Martinez	State: California	Country: USA
Zip Code/Country Code: 94553		
Utility Representative Contact Information		
Name: Christina Gee, Management Analyst	Phone: (925) 229-7390	Email: <a href="mailto:cgee@centralsan.org">cgee@centralsan.org</a>
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name: n/a	Title: n/a	Contact Information (phone or email): n/a
Current Program Members Only Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		

In what year did the utility achieve recognition as a Utility of the Future Today? n/a
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>7</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>8</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>9</sup> ( <input type="checkbox"/> IGP)

## Application Part 2: Organizational Culture

Central San has a strong organizational culture that enforces the core values and practices of the Utility of the Future. To do this, it recognizes that without people, Central San is simply pipes and pumps, so it values the skills, ingenuity, and intelligence of employees and stakeholders by creating opportunities to listen and learn. Central San respects its role as a steward of natural resources by distributing recycled water to augment the potable water supply and collecting household hazardous waste and pharmaceuticals to prevent them from entering waterways. These actions focus the business toward customer service through environmental protection, as well as responsiveness, hiring top talent, cutting costs through efficiencies, and maintaining rates at an affordable level.

Organizational culture is set by Central San’s leadership. The Board adopts the Mission, Mission, Values, and Goals, and staff develops the Strategic Plan, which sets strategies, initiatives, key success measures, and key performance metrics. The coordinated Executive Team emphasize and provide oversight over the implementation of the Strategic Plan via their weekly meetings and monthly meetings with the Management Team. The District stays attuned to internal priorities by maintaining an open line of communication with its staff.

Through a variety of public engagement efforts, including student education programs, a citizens academy, public tours, and a speakers bureau, Central San’s leadership gains feedback from stakeholders to respond to external community priorities. This also occurs at the Board level, when Board Members present to city and town councils, meet with local agency officials, and network at conferences. Central San recognizes that it does not operate in a vacuum and strives to be a present community partner.

Part of that commitment is recruiting, developing, and retaining its workforce and creating an atmosphere where talent grows and thrives. Central San is a learning organization which invests heavily in training and leadership opportunities, including a yearly Mentorship Program which pairs mentors, usually Executive or Management staff, with mentees who must complete and present a project to the Executive Team and/or Board during their six-month rotation. Central San also holds Supervisory and Management Leadership Academies for its employees in alternating years. This year, Central San invited staff from nine other agencies to join its Management Academy, leading to 15 of the 24 participants coming from other agencies. Many of Central San’s staff began as interns, obtaining valuable experience with Central San before successfully competing for employment post-graduation. In addition to its internal programs,

<sup>7</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>8</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>9</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

Central San offers tuition reimbursement and has a robust training budget to send employees to conferences and seminars to learn and share with their workgroups.

To ensure this knowledge is not lost, in 2014, Central San established a Succession Planning Committee which tracks vulnerable positions and ensures knowledge retention through standard operating procedures. Cross-training is encouraged and trainee positions are available for several positions throughout the organization. Employees who show initiative to take on more than is required are encouraged to do so to enhance their qualifications to advance in the organization. A Strategic Plan target to fill at least 25% of non-entry-level positions with internal promotions has been exceeded thus far this fiscal year, with 28% of those positions having been filled as promotions.

Central San values peer-to-peer partnering via participation in various professional organizations such as the California Water Environment Association (CWEA), California Association of Sanitation Agencies, advocacy groups (Central San staff serves as Chair of Bay Area Clean Water Agencies), and regulatory agencies. Central San's Managers participate in forums that unite their counterparts from other agencies to exchange ideas. Through participation in benchmarking studies both nationwide and regionwide on general utility practices, compensation, and benefits, Central San utilizes its peers' performance to measure its success and identify opportunities for improvement. Central San's General Manager is active in peer-to-peer relationships as he serves in leadership roles in local organizations and as Central San's representative in the Leading Utilities of the World, which convenes innovating utilities to share ideas globally. At 2018's American Water Summit, the General Manager mentored two water professionals, presenting a vision for the future of water. Central San stays abreast of new technologies through peer-to-peer organizations such as the Water Research Foundation Leaders Innovation Forum for Technology and CWEA. Central San staff also presents at conferences on successful pilot projects and business strategies, where they both share and gain knowledge from other agencies.

In the last few years, Central San has emphasized the drive to innovate and continuously improve. This is solidified in the Strategic Plan and the newly formalized Optimizations Program, which was rolled out in District-wide department meetings by presenting what has been done and emphasizing the need to continue to innovate. This fiscal year, each of the 11 Managers were challenged to optimize at least one process. Progress on all optimizations is reviewed quarterly by the Executive Team and Managers, with an annual report to the Board. The quarterly review allows the Managers to discuss areas of concern and work as a group to solve them. To protect against vulnerabilities, Central San has developed an internal audit program to evaluate business processes controls and compiled a risk inventory in preparation for an enterprise risk management program. The Strategic Plan sets targets for three pilot projects and three research papers to be presented every fiscal year, and Central San has completed five and four, respectively, thus far this year. The Strategic Plan, which was developed using the Effective Utility Management tool, drives Central San's priorities with a focus on continuous improvement.

Problem solving is performed daily throughout the organization, and the Plant Maintenance group has adopted a mantra: "Don't Just Fix It; Improve It." Any work that goes beyond a repair or preventative maintenance task is recorded and tracked as a "DJFI," and those DJFIs are reported in the Optimizations tracking as well as the Plant's monthly reports to the General Manager. Central San also has active Applied Research and Information Technology Leadership Committees, gathering staff from different divisions to evaluate piloting opportunities and technology solutions, respectively. Innovations, problem solving, and improving inefficiencies are infused into Central San's operations and are highly supported and funded as needed by leadership.

Successes are communicated to employees through the intranet, monthly newsletter, report to the Board, celebratory luncheon, and/or recognition at a conference. Central San is developing a recognition program for employees suggesting successful improvements, which will be established after an upcoming employee engagement survey.

The importance of workplace safety is enforced via the Safety Team’s regular trainings, quick response to emergencies, and accountability via the Strategic Plan’s metrics on injury and illness lost time incident rates.

Central San has several established processes for tracking Utility of the Future successes. The Managers report Strategic Plan progress quarterly using a tracker, which serves as a checkpoint and is reviewed by the Administration Committee, consisting of two Board Members. As mentioned, the Executive and Management Teams review Optimizations progress quarterly. The Succession Planning Committee tracks vulnerable positions with input from the Managers and meets quarterly, in addition to monthly updates provided directly to the General Manager. The General Manager also receives direct updates on information technology initiatives and asset management on a monthly basis.

Central San has adopted Core Values to meet the needs and wants of its customers and stakeholders via the Board’s adoption of the Mission, Vision, Values, and Goals. Staff uses these, along with the Effective Utility Management tool, as a framework to create each Strategic Plan. Through strong leadership and a dedicated workforce; active engagement with customers and stakeholders; providing the tools and resources for staff to develop and give back to Central San; participating in peer-to-peer networks to share information and drive the industry towards progress; creating and fostering a culture of continuous improvement; communicating and incentivizing success; and tracking and encouraging Strategic Plan progress, Central San’s organizational culture fits the mold of a Utility of the Future.

**Performance Measures & Results**

<b>Measure</b> What are you measuring?	<b>Targets</b> What was your goal/intended outcome?	<b>Outcomes</b> What were your actual outcomes?
<b>Supervisory Academy</b>	Hold every other year	Meeting target. Last held in 2018.
<b>Management Academy</b>	Hold every other year	Meeting target. Last held in 2019.
<b>Mentorship Program</b>	Held every year	2018 mentorships carried over into 2019
<b>Turnover rate</b>	≤4.8%	4.7% since July 1, 2018
<b>Average annual training hours</b>	15 hours/employee	13.9 hours/employee since July 1, 2018
<b>Actual versus budgeted usage of training dollars</b>	>80%	71% since July 1, 2018
<b>Internal promotions</b>	≥25%	28% since July 1, 2018
<b>DJFIs completed</b>	As many as possible	19 since July 1, 2018
<b>Employee injury and illness lost time incident rate</b>	<6.8	2.5 since July 1, 2018

**Application Part 3: Activity Area - Partnering and Engagement**

Central San’s first strategic goal is to provide exceptional customer service and maintain an excellent reputation, which it achieves by collaborating with its stakeholders to fulfill its goals and mission and enhance the community’s well-being. Central San has formalized partnerships to increase recycled water use and extend its pollution prevention services. Additionally, it performs outreach and seeks and offers assistance to other agencies through educational programs and multi-agency networks. Staff, including Board Members, meet regularly with stakeholders. Central San’s robust social media presence and customer-friendly website promote programs, services, and Central San’s role in the community’s health. Being readily able to serve new developments, Central San strengthens the economic well-being of the cities it serves. It also nurtures future talent through workforce development and its own internship and summer student programs. Through effective partnering and engagement, Central San strives to be a good neighbor, resource, and reliable service provider.

Since 2016, Central San has hosted a yearly citizens academy, Central San Academy, to the public. A total of 137 people have completed the program, which combines classroom learning, demonstrations, activities, and a tour for a comprehensive look at what Central San does. Staff researched similar

academies and modeled its program after Glendale, Arizona's Glendale University. Staff time and funds are required to deliver the program, and local cities, businesses, and organizations have assisted Central San in advertising it. The most critical obstacle is fine-tuning the curriculum to make a wastewater treatment class publicly appealing. Utilizing participants' feedback, the course has become increasingly engaging and draws more applications every year, receiving 69 in 2019 – a 146% growth since 2016. To learn more, other utilities can visit <https://www.centalsan.org/Academy>.

Central San is collaborating with other utilities to secure a dependable water supply. For example, it is developing an innovative recycled water exchange project which will serve two oil refineries and free up 20 million gallons per day (MGD) of potable water. Central San approached Contra Costa Water District and Santa Clara Valley Water District, developed a Memorandum of Understanding, and established a workplan. The most critical obstacles, an ongoing effort to overcome, are to present a solution that benefits all parties, including economic and financial impacts, water quality standards, and regulatory constraints. For additional information, other utilities can view presentations made to the Board.

To further augment regional water supply, per the request of DSRSD-EBMUD Recycled Water Authority (DERWA), Central San will divert a portion of its flow to create recycled water to help meet one of the DERWA agency's potable water usage reduction goals. Staff worked closely with DERWA to evaluate the request and identify a way to assist their needs. The most critical obstacles were addressing the potential negative impacts to Central San's stakeholders and allaying concerns from residents near the affected pumping station. These were overcome by developing guiding principles for the project and conducting public outreach. An updated wastewater model was used to measure the impact of the diversion to Central San's system. For additional information, utilities can view presentations made to the Board.

Central San is partnering with the City of Concord to supply recycled water to the redevelopment of the Concord Naval Weapons Station. This will require staff time and funds to construct the necessary infrastructure. The most critical obstacle is ensuring the water district's support, which was gained with an arrangement to supply the water wholesale through the water district. For more information, other utilities can visit [www.concordreuseproject.org](http://www.concordreuseproject.org).

Central San prevents pollution through partnerships with hardware stores and law enforcement agencies to provide residents with a convenient disposal site for batteries, fluorescent lights, and pharmaceuticals. Central San also extends the use of its Household Hazardous Waste Collection Facility to residents of Mt. View Sanitary District, an adjacent wastewater agency. The allocations of staff time and facility costs were negotiated. For more information, other utilities can contact the Environmental and Regulatory Compliance Manager.

Central San participates in the California Water/Wastewater Agency Response Network (CalWARN) to provide emergency mutual aid to other agencies. Central San's managers often network with their agency counterparts through listserves, meetings, and surveys to share best practices and stay abreast of industry changes. These activities require staff time. For more information, other utilities can contact the Risk Management Administrator or any of the Managers.

Central San is committed to instilling environmental stewardship habits in the community's youth via its pollution prevention education programs. It offers its award-winning Pipe Protectors Program for kindergarten to second graders, Water Wizards for elementary schoolers, and Sewer Science for high schoolers. These were developed by Central San staff with the input of local teachers. Staff time and funds are required to transport and provide supplies. The most critical obstacle is ensuring the material is engaging, which is overcome by making adjustments as the programs continue, and, in the case of the newest program, pilot testing it. Other utilities can view more information at <https://www.centalsan.org/student-programs>.

Central San hosts tables at events; holds quarterly plant tours; and supplies speakers upon request, all free of charge. It is also a founding contributor of a local instructional garden for water conservation and habitat restoration. With other utilities, Central San co-sponsors the Delta Discovery Voyage Program, which takes students on a boat to teach them about the source of their drinking water and how water quality is impacted. These programs were developed from a clear void in water quality education. The most critical obstacle is the competition for a finite amount of staff time and resources; however, Central San and partner agencies understand the impact of educating youth for the future of water quality. To learn more, other utilities can visit <https://www.centralsan.org/education>.

Central San won the 2018 California Water Environment Association Award for Community Engagement and Outreach Best Use of Social Media for its engagement on Facebook, Twitter, and YouTube. Staff posts regularly, responds quickly to questions and comments, and communicates proactively to enhance Central San's visibility in the community. Central San produces high-quality videos, including one furthering Wipes Clog Pipes awareness, which drove engagement to an all-time high of over 10,000 views in under three weeks. Central San also revamped its website in 2018 to make information more accessible to customers. To implement social media, Central San established guidelines through a Board Policy and Administrative Procedure. Staff created the account pages and content, requiring staff time. The most critical obstacle is creating buzz and gaining followers for the accounts. This is overcome by posting actively and developing engaging and creative content. To learn more, other utilities can visit [www.Facebook.com/CentralSanDist](http://www.Facebook.com/CentralSanDist), [www.YouTube.com/CentralSanDist](http://www.YouTube.com/CentralSanDist), and [www.Twitter.com/CentralSan](http://www.Twitter.com/CentralSan).

Outreach to stakeholders, including regulators, residents, and city leaders and elected officials, is performed regularly. Central San staff holds leadership roles with the Bay Area Clean Water Agencies and advocacy groups such as the California Association of Sanitation Agencies, California Special Districts Association, WateReuse, and the California Product Stewardship Council. Although Central San is an independent district, it reaches out to the ten cities served for the Board Members to present to their councils annually and hold liaison meetings with Central San staff and city officials. In advance of construction work, Central San hosts community meetings and sends letters to the homes impacted. This outreach requires staff time to prepare materials and attend meetings and is designed with input from stakeholders to determine the level needed to remind customers that Central San is available to assist and serve. The most critical obstacle is achieving the ideal level of exposure to maintain an excellent reputation and be seen as an accessible and reliable community partner and environmental leader. To learn more, other utilities can contact the Communication Services and Intergovernmental Relations Manager.

Central San enhances the economic well-being of the community by being readily able to provide wastewater service to new developments, allowing the cities served to attract growth of new businesses and residences. Central San strategically ensures that its infrastructure can serve the entire district, including undeveloped areas designated for future development. The most critical obstacle is maintaining visibility so that Central San is included early in the cities' plans to attract development. For more information, other utilities can contact the Planning and Development Services Division Manager.

Central San also fosters economic well-being through workforce development programs. The Human Resources Manager participates in BAYWORK, a collaborative of water and wastewater utilities for ensuring workforce reliability. She confers with BAYWORK's members on initiatives and activities to develop talent for mission-critical positions. The Human Resources Manager is also part of a consortium working with the Environmental Protection Agency to provide input on how workforce development needs can be met with assurance at the federal level. The most critical obstacle is to find time for these efforts, which is solved through delegation of tasks. To learn more, other utilities can contact the Human Resources Manager.

Central San serves as one of 19 industry partners with the Bay Area Consortium for Water and Wastewater Education, which supports people entering or advancing in the water and wastewater industry. Central San provides financial contributions, class locations, administrative support, instructors, and connections to employment opportunities. The most critical obstacle was to transition the program administration following a retirement, but it was seamlessly transferred to the retiree’s successor. For more information, other utilities can visit <http://www.bacwwe.org/industry.php#partners>.

Central San staff attends college job fairs and administers its own internship and summer student programs, which provide hands-on, productive learning experiences in diverse fields for college students and recent graduates. Central San has long provided young people with these opportunities, by working with its hiring divisions and advertising the program online and at schools. Staffing costs are budgeted yearly, and some regular-employee staff time is needed for supervision. The most critical obstacle is retaining qualified interns for the duration of the employment agreement. Because they are concurrently seeking permanent employment, some have left their positions early. To overcome this, divisions are better evaluating who they hire and plan ahead for potential departures. For more information, other utilities can contact the Human Resources Manager or view active seasonal recruitments at <https://www.governmentjobs.com/careers/cccsd>.

Through partnering and engagement with all stakeholders and working to develop the environmental stewardship and economic strength of the community, Central San strives to position itself as a critical resource to its community by listening to its needs, acting as a leader, and being a reliable Utility of the Future.

### Performance Measures & Results

Measure What are you measuring?	Targets What was your goal/intended outcome?	Outcomes What were your actual outcomes?
Awards or recognitions received	10	10 since July 1, 2018
Water diverted to create recycled water for DERWA	No target amount yet. The current target is to construct a facility that meets the project’s guiding principles and mitigates negative impacts to Central San’s pumping station and residents	Project is in final design and is expected to be constructed summer 2019
Water freed up by supplying water to refineries	20 MGD	Currently working on planning to treat the water to the desired quality and determining cost allocation and required infrastructure improvements
Pharmaceuticals collected via Collection Program	As much as possible	>127,400 pounds from 2009 to 2018
Household hazardous waste collected in partnership with local hardware stores	As much as possible	>500,000 feet of fluorescent lamps and >150,000 pounds of batteries from 2009 to 2018
Household hazardous waste collected from residents of Mt. View Sanitary District	As much as possible	~252,535 pounds collected in FY 2017-18
Board Member meetings with city officials and presentations to councils	As requested by councils	24 total since July 1, 2018
New employees attending customer service training within 6 months of employment	100%	100% since July 1, 2018
Students served by educational programs	>4,000 per year	4,274 students since July 1, 2018
Participants in Plant tours and District presentations	>500 participants per year	1,122 participants since July 1, 2018
Central San Academy graduates	>30 per session	39 in 2019

Social media engagement	As much as possible	311 followers and 274 likes on Facebook currently
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# Charlotte Water, NC

## Energy Efficiency



### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: Charlotte Water		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): 5 Wastewater Plants (123 MGD), 3 Water Plants (242 MGD), 90,000 WT of biosolids produced, 4200 miles each water and sewer lines, 82 lift stations, 70 Significant Industrial Users, approximately 6000 permitted Food Service Establishment. Charlotte Water is and Enterprise Fund Department of the City of Charlotte.		
Service Area (square miles): 530	Average Annual Daily Flow or Demand (MGD): 80.0 MGD	
Population Served: ~ 1,000,000		
Location		
Street Address: 4222 Westmont Drive		
City: Charlotte	State: NC	Country: United States
Zip Code/Country Code: 28217		
Utility Representative Contact Information		
Name: Angela C. Lee	Phone: 704-336-5911	Email: alee@ci.charlotte.nc.us
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name: Jackie Jarrell	Title: Operations Chief	Contact Information (phone or email): jjarrell@ci.charlotte.nc.us
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016 and 2018		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input checked="" type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>10</sup> <input checked="" type="checkbox"/> Activity Area 3: Energy Efficiency <input checked="" type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>11</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>12</sup> ( <input type="checkbox"/> IGP)		

## Application Part 2: Organizational Culture Narrative

Charlotte Water (CLTWater) provides drinking water and sanitary sewer services to over one million people in the Charlotte, N.C. region. CLTWater is a city department with strong interlocal agreements linking Charlotte, six towns (in Mecklenburg County) and Mecklenburg County to provide retail service. Expanding farther regionally, other agreements with neighbors provide for retail and/or wholesale service provision or receipt, including providing support and regional solutions that benefit our respective communities. Our regional and community partnerships extend beyond traditional partners to provide an environment of inclusiveness and to gain all perspectives. Our organizational culture promotes the principles of Effective Utility Management throughout our operations. We pride ourselves on being a progressive utility always looking towards the future in support of our community and region. CLTWater is a recognized leader in the operations and management of our utility. All five of our wastewater plants have been recognized for NACWA peak performance awards on an annual basis for close to 20 years. CLTWater was recently recognized by the Design Build Institute of America as the Owner of the Year for the Southeast Region.

CLTWater’s organizational culture is one of sustainability both now and for the future embracing innovation, inspiration and leadership in our community. This can be seen in our mission and vision statement:

**Charlotte Water Vision:** We will be the recognized leader in the region, state, and nation by contributing to the health, safety, and economic well-being of our customers; in protecting and conserving our natural resource and environment; and in providing for the growth and development of our employees.

**Charlotte Water Mission:** We are committed to customer satisfaction and confidence by providing responsive services, reasonable rates, system capacity, and effective communication. We provide safe and sufficient drinking water by protecting, treating, and distributing drinking water. We protect the

<sup>10</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>11</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>12</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

environment by collecting and treating wastewater, reusing residuals beneficially, and regulating system discharges.

CLTWater's Leadership Team integrates strategic planning and budgeting process for overall business planning. This integration ensures that financial decisions are driven by a strategy that prioritizes the most pressing departmental issues while keeping in mind the triple bottom line. The business plan is aligned with City of Charlotte Focus Areas with these three sustainable aspects -- Social, Financial and Environmental Stewardship.

Environmental Stewardship: CLTWater supports the City of Charlotte's goal for development of a Circular Economy through the development and improvements for our community.

CLTWater champions innovation in every facet of operations and management in response to effectively contributing to the community's well-being. CLTWater plays an integral part of the planning and implementation of energy efficiency goals for the City. Our workforce initiatives and Community Investment Program (CIP), provide a foundation to prepare us to meet the needs of Charlotte and our surrounding communities. CLTWater focuses and aligns with our City and regional goals to identify projects that will provide sound infrastructure, promote a culture of diversity and inclusiveness in our workforce and develop our employees.

CLTWater, by nature, considers energy efficiency in our normal day-to-day operations and maintenance of the treatment facilities and incorporates energy efficiency measures into the planning, engineering, and design of new processes and projects. In addition, the City of Charlotte was selected as one of the recipients of the Bloomberg American Cities Climate Challenge. CLTWater is an active participant as the goals of this program encouraging the philosophy of circular economy through initiatives that include workforce development, alternative energy and resource recovery.

Social Responsibility: CLTWater is a key partner in the non-profit Catawba-Wateree Water Management Group which is made up of 18 water utilities and Duke Energy. Included in the larger group is the Lower Catawba Stakeholder group. This is a bi-state (NC/SC) collaboration for the development of a nutrient Total Maximum Daily Load (TMDL) for the Lower Catawba River. The Catawba-Wateree River Basin provides water to sustain human existence to nearly 2 Million people in the foothills and piedmont of North and South Carolina.

CLTWater regularly participates in community events and citizen forums. This includes job fairs, career fairs and neighborhood meetings/events. CLTWater hosts a "Water Wagon" at festivals and other large social gatherings in the area. This mobile water cooler provides free water to anyone who asks including their pets. This allows CLTWater to reach large numbers of citizens to promote the value of water and its' importance to our community.

The Charlotte Water Advisory Committee, which is appointed by City Council, reviews service extension policies and capital plans and advises City Council as needed.

CLTWater has granted rights of way to treatment plant property to the extensive greenway system of walking, hiking and biking trails. Trail users have vistas of the treatment facilities. Kiosks were developed to explain the treatment processes and the facilities they can see.

CLTWater makes wellness programs available to employees. Organized exercise programs and wellness rooms are utilized at numerous facilities. There are organized softball and basketball competitions and other fun activities planned throughout the year. The "My Health Clinics" are a free or low fee option provided by the City that are being heavily utilized by employees.

CLTWater recognizes annually industrial customers who demonstrate consistent compliance with discharge and reporting requirements through the Environmental Excellence Awards luncheon. The

industries are also published in the newspaper in an advertisement each year. There are over 70 Significant Industrial Users monitored by the System Protection Division.

CLTWater has funded construction of a new regional treatment facility that will expand our services into neighboring Gaston County and provide service to the towns of Mt. Holly, Belmont and the western section of Mecklenburg County. This \$259 Million facility has the potential to employ newer and more efficient technologies and provide opportunities for expanded water reclamation/reuse projects. Public stakeholder involvement is part of the process. The project team is comprehensive with engineering, operations and management all on the steering team.

CLTWater continues to champion continuous improvement initiatives through certifications to ISO standards and employing Effective Utility Management doctrines. The Environmental Management Division utilizes the 14001 Environmental Management System. The Customer Service Division practices Quality Management through 9001 Certification. CLTWater has partnered with Raleigh, NC to compare and learn about our respective programs. The Laboratory Services Division maintains the National Environmental Laboratory Accreditation Program. The Water Division adheres to the Partnership for Safe Water programs.

Workforce Development: CLTWater is coordinating and developing a workforce development initiative in response to the needs of CLTWater, the City, Charlotte employers, and job seekers to enhance and promote the local economy. The City of Charlotte is now using our Pipeline Academy program as the model for the citywide Career and Training Academy program.

Program Name: **Apprenticeship Program**

Program Birthdate: June 2018

Purpose: The Apprenticeship Program is registered with the Department of Labor (DOL). It is designed to increase productivity, train Apprentices in various Utility positions, and improve the quality of the workforce. The Utility Technician position was the first occupation developed. The classroom training includes soft skills, financial literacy, and wellness. The on-the-job training includes hands-on application as part of a utilities crew and applying what they have learned. Upon successful completion of the Apprenticeship Program, Apprentices will earn a nationally recognized credential from the DOL which can secure employment and advancement along a rewarding career path. Our goal is to increase the number of apprenticeship positions through the department. The first apprenticeship class will graduate in June 2019.

Program Name: **Pipeline Academy**

Program Birthdate: February 2019

Purpose: Charlotte Water Pipeline Academy has a goal of educating young adults about the water and wastewater industry and its career opportunities. The program will also develop a pipeline of future workers with the skills and abilities needed to fill entry-level positions in CLTWater, other City of Charlotte departments, and similar industries. Plans are to also certify participants in green infrastructure.

Program Name: **Job Shadowing**

Program Birthdate: 2017

Purpose: An opportunity for employees to be exposed to a different position by observing and/or working alongside another employee to gain insight into that career. Employees will learn about the responsibilities and requirements for the position and increase their awareness of other opportunities within the utilities industry. Our goal is to provide career pathing opportunities for our employees that help them make the best decision for their career.

Program Name: **National Green Infrastructure Certification Program (NGICP)**

Program Birthdate: 2018

Purpose: A national program comprised of a curriculum to help prepare students to take an exam to become NGICP certified. The certification supports the development of green workforces and establishes a career path for skilled green infrastructure workers. CLTWater has three certified trainers that will partner with the Workforce Development team to provide training for the Pipeline Academy interns and Apprenticeship participants. This additional skill set and certification will provide better employment opportunities for the participants long term.

Leadership Development: Program Name: **Leadership Education and Development (LEAD) Management Sessions**

Program Birthdate: 2019

Purpose: Quarterly meetings that will provide current supervisors and managers updates on city and departmental policies, processes, and hot topics. These sessions are mandatory for all supervisors and managers. The goal is to ensure that all managerial staff is informed and aware of guidelines that impact their role and allows them to be a more effective leader.

CLTWater has also partnered with the North Carolina American Water Works Association and Water Environment Association to provide a series of leadership development programs for entry to mid-level supervisors. CLTWater actively supports employee participation in professional organizations and pursuit of continuing education opportunities.

Financial Management: CLTWater continues to maintain a Triple A (AAA) credit rating with Moody's Investor Service, Standard and Poor's and Fitch Ratings. This is the highest credit rating attainable. The Community Investment Plan supports City doctrines of: Well Managed Government; Economic Development; Mobility, Accessibility and Connectivity; Safe, Healthy and Inclusive Communities. A total of \$1.6 Billion is proposed over the next five years for Rehab and Replacement, Public Projects, Utility Operations, Capacity for Growth and Regulatory Requirements.

### **Application Part 3: Activity Area – Energy Efficiency**

**Overview Paragraph:** CLTWater champions energy efficiency in many areas of our business including day-to-day operations and project planning and design. We also participate in and support city-wide energy initiatives. One of our biggest energy efficiency achievements is participating with other City of Charlotte Departments to develop a Strategic Energy Action Plan (SEAP). The plan will include short, mid and long-term initiatives. The intention of the SEAP is to support the goals of a Council Resolution in support of a Sustainable and Resilient Charlotte by the year 2050. This includes a long-term goal to source 100% of the energy use in City buildings and free from zero carbon sources by 2030. SEAP focuses on three areas where there is opportunity for reduction in emissions – buildings, transportation and energy generation. CLTWater supports this effort by evaluating and implementing processes and projects in all three of the emission reduction areas that will increase energy efficiency and, as a result, reduce emissions. The following activities demonstrate how CLTWater has committed to the SEAP and energy efficiency:

CLTWater participates in energy efficiency programs for occupied buildings (administration buildings) that are being renovated or newly constructed. We currently have two new buildings with LEED certification and one in design to obtain LEED certification, and another renovated building with EnergyStar certification.

CLTWater has implemented energy conserving operational methods to reduce consumption for energy-intensive systems like pumping and aeration. The aeration systems use dissolved oxygen monitoring

and/or ammonia-based aeration control to optimize blower usage and chemical feed rates. Also, electrical engineering staff monitor energy usage to troubleshoot and correct any issues that increase power demands in a timely manner.

As a standard practice, CLTWater considers energy reduction or energy creation while evaluating equipment purchases and during all aspects of CIP project design and construction. For example, CLTWater requires premium efficiency motors, the use of variable speed drives for equipment like pumps and have selected multistage or high-speed turbo blowers during ongoing aeration system upgrades. There are several CIP projects with energy efficiency drivers including implementing aeration system upgrades at four of our five facilities including the largest facility in our system McAlpine Creek, a pilot of a new granular activated sludge process, a nutrient harvesting project, and a system-wide UV disinfection replacement program.

### **Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph? CLTWater actively looks for ways to be more energy efficient. Potential energy efficiency measures are discovered during participation in efforts like LIFT, through employee innovation while operating and maintaining facilities, by internal engineering and engineering consultants during project planning and design, during equipment pilots, and by facility rehabilitation teams who identify needs in monthly meetings. Once an efficiency measure is identified, CLTWater develops a business case for more expensive improvements or projects. This may require piloting equipment or processes through the Water Research Foundation or with other partners like the University of North Carolina at Charlotte (UNC Charlotte). The more expensive energy efficiency measures are implemented by multi-departmental teams during CIP projects. Less expensive improvements or projects can be implemented by operations and maintenance staff (i.e. switching to inductive lighting) using operating funds.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other) Financial, staffing, and technical resources have all been critical to successfully implementing energy efficiency measures at CLTWater's resource recovery facilities.

The funding sources we have used for energy efficiency projects vary with the type of project and have included operating funds, CIP fund, loan assistance through the Clean Water State Revolving Fund, and public-private partnerships (P3). Since 2018, CLTWater has begun spending funds on projects that will total over \$150 million during the next ten years for energy efficiency measures like the aeration system, UV, and biosolids program improvements.

Adequate engineering and project management staff resources were necessary for implementing the larger projects that are funded by the CIP. Also, having highly skilled operations and electrical/mechanical maintenance staff has been critical for ensuring energy efficiency is maintained once the equipment and systems have been installed. Additionally, CLTWater's finance and procurement professionals have proven to be an important part of the team when planning for and executing the energy efficiency projects.

CLTWater has broad internal technical resources and the ability to use external resources for technical guidance and support like LIFT, WEF, WERF, and various engineering consulting firms. CLTWater is also using alternate delivery methods like Design-Build and Construction Manager At Risk for project design and construction for more successful project outcomes (schedule, cost, constructability, energy efficiency).

Did you partner with other stakeholders or organizations as a part of your implementation process? CLTWater has multiple partners on various projects including other city departments and the community to meet Charlotte sustainability goals and other municipalities to look at long term planning and implementation of new facilities. We are a member of the Strategic Energy Action Plan Steering

Committee for the City and through this have gained Citywide support for some of our projects. We work in partnership with our power company to identify opportunities for renewable energy. LIFT has also been of great partner by introducing us to and helping us evaluate new technology. We were a LIFT See It scholarship recipient in 2018 and had the opportunity to tour resource recovery facilities in the Midwest.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that? Securing funding for projects is the biggest obstacle that we face. CLTWater manages a \$1 billion 5-year CIP and has critical rehabilitation/repair/replacement/improvement needs in every aspect of our aging and growing system. As with any project funding request, teams had to develop business case justification for energy efficiency projects that discuss the total cost of ownership, risk analysis (regulatory, operational, reliability, safety, security, etc.), and alignment with City and regional goals. These thorough business case justifications helped prioritize the energy projects and secure funding. The proposed alternative financing methods for some of the energy efficiency projects helped CLTWater implement improvements more quickly.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe. CLTWater has optimized energy efficiency by installing communication and data storage capabilities to monitor the power used by equipment. This technology allows us to capture data automatically and not rely on time-intensive manual data collection. By capturing power data automatically, we are able to trend power usage and compare it to historical data to detect and respond to issues more quickly.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented? Utilities can use the plethora of resources provided by LIFT, the Water Resource Foundation, the EPA, WEF, or member associations to find additional information about improving energy efficiency at resource recovery facilities. CLTWater is happy to share information with other utilities about Charlotte’s Strategic Energy Action Plan or the specific projects we have or are implementing to support it.

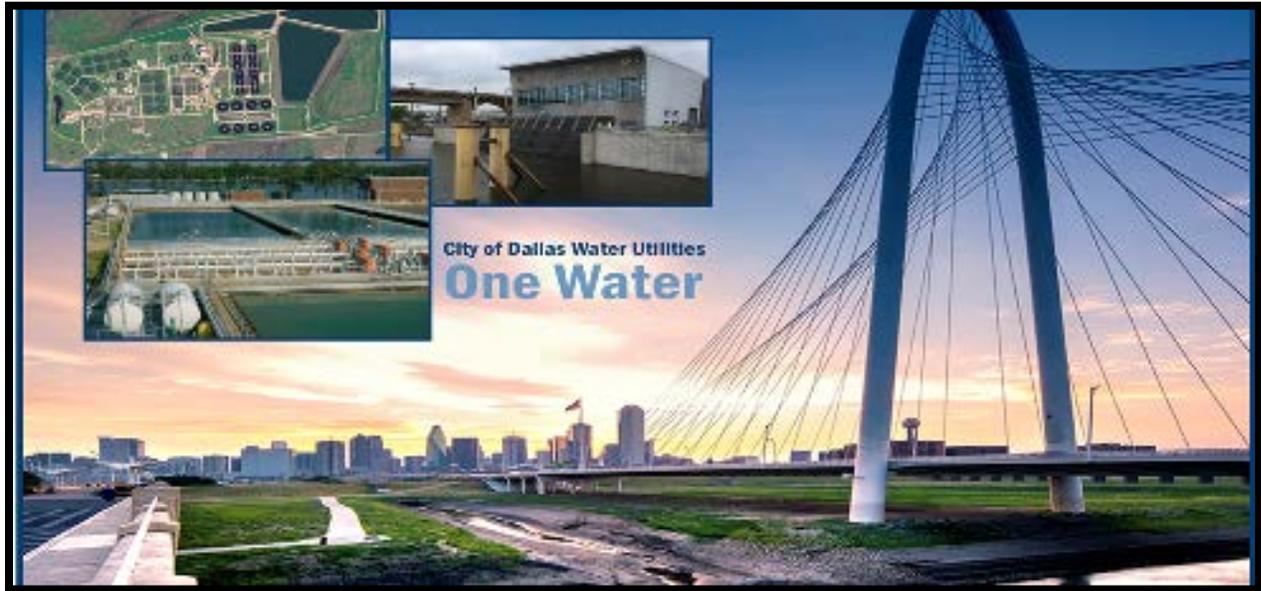
**Performance Measures & Results:**

<b>Measure</b> <b>What are you measuring?</b>	<b>Targets</b> <b>What was your goal/intended outcome?</b>	<b>Outcomes</b> <b>What were your actual outcomes?</b>
Improvements and upgrades to treatment plants that result in more reliability and energy efficiency	Optimize our operations for more reliability and lower carbon footprint Reduce chemical and power usage Reduce maintenance intensity Provide the opportunity for resource recovery	Designed and implementing the McAlpine Creek Aeration System Pilot for alternate process control strategies including side stream Enhanced Biological Phosphorus Removal as part of the RPI project (\$10 million) Designing the McAlpine Creek RPI Project involving installing new blowers and process control and nutrient removal infrastructure (\$120 million) Replacing UV disinfection systems over the next five years at four wastewater treatment facilities with more efficient and reliable systems. It is estimated that we will have a 30% energy reduction on the Mallard Creek WRF that is currently under design (\$10 million) Piloting a granular activated sludge process in order to determine if it is the best technology for the new regional resource recovery facility to be

		constructed in north western Mecklenburg County and for a new treatment train for the McDowell Creek WWTP (\$250,000)
Partner with Duke Energy to identify power savings alternatives	Work with local partners to meet City and regional goals Promote new workforce opportunities in our community	Working with Duke Energy and the City of Charlotte through the American Cities Climate Challenge for potential solar installations at two of our treatment facilities.
Conduct and participate in energy research activities	Continue to be a progressive utility by always looking for ways to continually improve	Continue active involvement in LIFT and the Water Research Foundation and partner with UNC-Charlotte on several projects
Use of Alternative fuels and technologies	Reduce our carbon footprint Promote resource recovery Promote new workforce opportunities and business opportunities	Researching the potential for renewable natural gas (RNG) as a pilot at the Mallard WRF and full scale at other facilities such as McAlpine Creek. CLTWater is exploring a potential collaboration with Charlotte Area Transit to fuel buses from the methane gas produced at the facilities. Implementing the CLTWater biosolids masterplan that includes installing solar drying at one plant and regionalizing most of our biosolids operation to McAlpine Creek utilizing thermal hydrolysis process (THP) and anaerobic digestion for treatment. THP will improve digestibility of the sludge and produce more methane gas to be used beneficially by CLTWater and potentially other City of Charlotte Departments. Implementing a nutrient harvesting P3 project at McAlpine Creek
Establishment of performance metrics for power consumption and energy use		Working with other City of Charlotte Departments to meet the City Council Sustainability resolution to meet 2050 goals. Also working to meet the American Cities Climate Challenge Goals for 2022.

# City of Dallas Water Utilities, TX

## Watershed Stewardship



### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: City of Dallas Water Utilities		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): <b>Regional System</b> consisting of: 7 water supply reservoirs (6 connected); <u>Water</u> : 4,983 miles of water mains, 3 water treatment plants (900 MGD combined capacity), 23 pump stations, 9 elevated and 12 ground storage tanks; <u>Wastewater</u> : 4,040 miles of wastewater mains, 2 wastewater treatment plants (280 MGD combined capacity), 15 wastewater pump stations; <u>Storm Drainage</u> : 1,963 miles of storm sewers, 8 storm water pump stations (2.8 BGD combined capacity), 30 miles of levees, 39,000 acres of floodplain		
Service Area (square miles): 699	Average Annual Daily Flow or Demand (MGD): Treated 389.0 MGD water and 169.9 MGD wastewater in FY18	
Population Served: 1.3 million retail and 1.2 million wholesale		
Location		
Street Address: 1500 Marilla, 4AN		
City: Dallas	State: Texas	Country: USA
Zip Code/Country Code: 75201		
Utility Representative Contact Information		
Name: Karen E. Menard	Phone: 214.670.5887	Email: karen.menard@dallascityhall.com

## **Application Part 2: Organizational Culture**

The City of Dallas adopted a Service First motto in 2017 which aligns with our new Values of Service we refer to as the 4E's – Empathy, Ethics, Excellence, Equity. The following activities demonstrate the Dallas organizational culture through our values of service:

**Empathy:** We demonstrate compassion by listening and understanding.

Six Employee Resource Groups operate under the banner of the Diversity and Inclusion division of the Human Resources Department. They are voluntary and employee-led. These groups promote a workplace that is diverse, inclusive, and aligned with organizational goals, values, business practices, and objectives.

Annual meetings with DWU wholesale customers enable us to receive feedback both on the wholesale rates and customer impacts that may arise over the year.

Approximately 40 annual Town Hall meetings are held annually throughout the city to receive input from citizens on the budget/bond program and other topics of concern. In addition, DWU provides support to neighborhood associations and homeowners groups throughout the year.

DWU continually enhances its social media platforms.

**Ethics:** We believe in being transparent, open and honest.

The City's Code of Ethics, found in the City Code, is a roadmap for how employees uphold the City's commitment to the highest standards of professionalism, customer service and integrity. The Office of Ethics and Compliance ensures that every employee has undergone mandatory training for ethics.

Established Personnel Rules and Administrative Directives dictate behavioral expectations for all employees. These expectations are introduced during new employee orientation and are reinforced during employee performance planning process and training opportunities. All employees are required to review the personnel rules and certify by signature that they will comply with the rules.

Employees are encouraged to report issues to their supervisors and may also contact the City Auditor's "Fraud Waste and Abuse" Hotline, the Office of Ethics and Diversity and the DWU Employee Advisory Council (EAC).

DWU follows all State and city purchasing procedures and provides training. All contracts are reviewed by the City Attorney's Office to ensure they are executed ethically. Additionally, DWU's financials are audited annually by an external auditor and DWU's revenue estimate for the upcoming fiscal year is audited by the City Auditor's Office.

**Excellence:** We are committed to continuous improvement.

DWU is currently certified in ISO 9001:2015 (Quality), ISO 14001:2015 (Environmental) and OHSAS 18001: 2007 (Occupational Health and Safety). As part of the ISO Management Review process; monthly executive steering committee meetings, quarterly manager meetings and quarterly divisional management reviews are conducted to assess process performance and provide recommendations for improvement. The department undergoes internal and external audits to verify those standards are met in order to maintain certification.

Dallas has appointed its first chief innovation officer to lead Dallas' newly-created Office of Innovation. This position will drive operational and technological improvements, create change by introducing new ideas to city leaders and encourage new and innovative projects. Additionally, the COD has initiated a Lean Six Sigma (LSS) program through the Office of Innovation which formalizes and enhances performance improvement efforts. DWU has its own blackbelt certified manager to provide guidance and support for green belt projects throughout the department.

Dallas has implemented a Smart City approach of investment in technologies such as communications infrastructure, big data and analytics, and applications that can be leveraged horizontally across City departments, use cases, and domains. By using technology, data, and applications for multiple purposes, the City delivers more value to citizens in the form of gains in efficiency, effectiveness and quality of services.

The Emerging Leaders program is a self-paced development program to provide training, tools, and resources for self-identified Emerging Leaders. It is open to any employee aspiring to become a future leader or develop current leadership skills.

City University provides education, training and development to help employees Build, Innovate, and Give in Your Work - Your Life - Your Community. The University is a centralized and systematic umbrella for continuous learning, development and performance improvement in support of the City of Dallas key focus areas.

In partnership with the Human Resources Department, DWU developed and completed its first year of a succession planning program for our critical operations leadership.

Equity: We understand the diverse needs of the community we serve.

The Office of Equity and Human Rights supports City leadership and staff through education and training in the identification and elimination of systemic barriers to fair and just distribution of resources, access to services and opportunity and proper investigation of discrimination complaints. An Equity Core Team has been created with diverse employees representing every department.

The Office of Business Diversity is committed to ensuring non-discriminatory practices and eliminating barriers while resourcing businesses to the next step in their business life cycle. It is the policy of the City of Dallas to involve qualified Minority and Women-Owned Business Enterprises (M/WBEs) to the greatest extent feasible on the City's construction, procurement and professional services contracts.

DWU participates with other departments (Parks, Economic Development, etc.) to support economic development and quality of life improvements throughout the city.

DWU provides assistance to low-income customers and utilizes a multi-tiered rate structure that promotes water affordability for basic water service needs.

### **Application Part 3: Activity Area - Watershed Stewardship**

#### **1. Overview Paragraph**

In September 2018, two departments within the City of Dallas, Dallas Water Utilities (Water and Wastewater Provider) and Trinity Watershed Management (Storm Drainage Provider), merged to create a "One Water" department that will allow Dallas to manage watersheds, water resources, and water facilities in a more environmentally, economically and socially beneficial manner.

The "One Water" concept requires flexibility and an openness to diverse solutions instead of linear thinking. The benefits of the "One Water" approach include greater resiliency and reliability, opportunities to optimize regional infrastructure, sustainable community development, regulatory flexibility, and economic growth opportunity.

In addition to the "One Water" Concept, the following are other initiatives undertaken by the City to protect and more efficiently make use of our limited water resources -

The City of Dallas Water Utilities Department participates in the Upper Trinity Basin Water Quality Compact with the City of Fort Worth, the Trinity River Authority, and North Texas Municipal Water District to facilitate cooperative stream flow and water quality monitoring, studies and activities related to

water quality, wastewater collection and treatment, discharge and reuse of reclaimed water and regulatory matters in the Upper Trinity River Basin. The Upper Trinity Basin Water Quality Compact has developed water quality models along the Trinity and coordinated wastewater discharge limits on its participants wastewater discharge permits to limit loading within the river.

Dallas Floodway Extension Project creates the Great Trinity Forest which is comprised of 6,000 acres of bottomland hardwood. City currently owns more than 4,000 acres. Conservation and management efforts through the City and the US Army Corps of Engineers results in hydraulic and environmental mitigation.

The Upper and Lower Chain of Wetlands, both completed projects, provide hydraulic mitigation and environmental benefits through the planting of native and hybrid planted materials specific to the region.

The utility sponsored the Branch Out Dallas efforts to restore tree coverage in neighborhoods across Dallas which helps to address the quality and quantity of the stormwater runoff, reduce heat island effect and improve air quality.

Dallas 2014 Long Range Water Supply Plan (2014 LRWSP) projects Dallas' demand for 50 plus years and identifies the supplies and infrastructure needs to meet the projected demands. The plan identifies approximately 40 percent of its future supply to be achieved through water conservation and reclaimed wastewater.

Dallas has launched a climate action website for the public to find information about and track the progress of the city's environmental and climate efforts. The website is part of the Comprehensive Environmental and Climate Action Plan, which the Dallas City Council passed earlier this year.

Dallas adopted a Green Energy Policy on April 10, 2019 requiring the City to use 100% renewable energy going forward while also identifying new ways to add solar and other renewable energy capacity in our community

DWU has an extensive leak detection, repair, and pipeline replacement program. DWU is committed to maintaining a rate of less than 10 percent for unaccounted-for water losses in its water system. In FY18, DWU's water loss rate was 6.41%.

The Blue Thumb Award recognizes Significant Industrial Users (SIUs) that discharge into the Dallas Water Utilities Publicly Owned Treatment Works (POTWs) and demonstrate outstanding compliance with the Pretreatment Program. This award program started in 1987 when DWU acknowledged the need to recognize the industries that are helping to protect human health and enhance the environment by protecting the water quality of the Trinity River.

Moody's Investor Service produced a report in January 2019 that showed that the City of Dallas trails only New York and San Francisco in climate mitigation projects planned or underway – it also identified these projects as a credit positive for the City.

Dallas Water Utilities currently utilizes direct water recycling by using treated effluent from its Central Wastewater Treatment Plant to irrigate two City-owned golf courses, reducing potable water demand.

The utility is currently participating in the Texas Commission on Environmental Quality's Sanitary Sewer Overflow initiative. The goal of the program is to reduce sanitary sewer overflows in the collection system using a pro-active approach.

## 2.Question & Answer (Related to "One Water Concept")

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Dallas Water Utilities and Trinity Watershed Management merged into a single department. Business units were created or realigned to support efficient delivery of water, wastewater and storm drainage services. Additionally, a Management of Change Action plan was developed to integrate both department’s ISO Management systems into one combined system.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

No additional resources were necessary to support implementation of “One Water”. Due to the efficiencies gained by consolidating business functions such as Financial Planning, Capital Improvements, etc. several FTE’s were able to be eliminated in the merger.

Did you partner with other stakeholders or organizations as a part of your implementation process?

Yes. DWU worked closely with the Office of Environmental Quality and Sustainability during the implementation process.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Because both departments are enterprise funds, the revenues collected and expended need to remain separate. This can become difficult to track with the consolidation of work activities and business program units. The functional units were set up in a manner to be able to accurately track funding.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

No.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

To inquire or obtain additional information about DWU’s “One Water” merger, please contact Richard Wagner, Assistant Director, DWU Business Operations at 214-670-3152 or richard.wagner@dallascityhall.com.

**Performance Measures & Results (Relative to Watershed Stewardship):**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Percentage Compliance with state and federal standards and regulations for drinking water	100%	100%
Main breaks per 100 miles of main	28	28
Number of sanitary sewer spills per 100 miles of main	3.0 (national avg is 6.2)	3.1 (Annual Avg)
Water Conservation	1% annual reduction in GPCD	Over the last 10 years, DWU has averaged a 1.2% annual reduction in GPCD
Water Loss	10%	6.41%
Environmental Education Initiative	15,000 students	26,914 students
Industrial, Commercial, Institutional Audit Program	60 audits	183 audits Water Savings: 100,207,935 gallons
Free Irrigation Evaluations	700 evaluations	491 evaluations Water Savings: 15,942,081 gallons
Minor Plumbing Repair Program	200 families served	316 families served
New Throne for Your Home Program	N/A	3,645 toilets

		Water Savings of MPR + NTFYH: 19,649,080 gallons
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# City of El Dorado Wetlands and Water Reclamation Facility, KS

## Partnering and Engagement



### Application Part 1: Background Information

<b>Utility Description (combine all plants if a multi-site system)</b>		
Utility Name: El Dorado Wetlands and Water Reclamation Facility		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Single Plant		
Service Area (square miles): 9	Average Annual Daily Flow or Demand (MGD): 2MGD	
Population Served: 13,141		
<b>Location</b>		
Street Address: 105 W Wetlands Dr.		
City: El Dorado	State: Kansas	Country: USA
Zip Code/Country Code: 67042		
<b>Utility Representative Contact Information</b>		
Name: Jason Patty	Phone: 316-322-4981	Email: jpatty@eldoks.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b>		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		

In what year did the utility achieve recognition as a Utility of the Future Today?

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in 2016 and/or 2017.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>13</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>14</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>15</sup> ( IGP)

### **Application Part 2: Organizational Culture:**

As part of the Public Utilities Department for the City of El Dorado, KS, the Wetlands and Water Reclamation Facility (WRF) is determined to manage, utilize, and protect El Dorado's resources to benefit the citizens of El Dorado both now and for future generations to come. The WRF has a long standing history of excellence with regards to NPDES permit compliance and currently maintains NACWA's Platinum Peak Performance 6 status. In addition to great quality effluent the facility operators take great pride in their work and have been awarded six Plant of the Year awards from the Kansas Water Environment Association (KWEA) as well as three Bio-solids of the Year awards also presented by KWEA since coming on line in 2007. The well-being of staff is not something we take lightly and as a result were rewarded with the George W. Burke Safety award presented by the Water Environment Federation. As evident, our organizational culture is centered on safe, efficient, and quality treatment practices.

Beyond that, leadership is very forward thinking with regards to educating our youth, Environmental impact, and succession planning. We host several tours each year that include a wide range of age audiences. While the technical language of the industry might be a little much for our younger audiences I feel just getting them in the door and explaining wastewater to them on their level is a huge benefit for the community and may potentially peak some interest about water in the future. As the industry work force gets older and several operators think about retirement the void left by them will be great. For these reasons we welcomed participation in a Work-in-Water intern program orchestrated by Wichita State University as the inaugural pilot three years ago. The program is designed to target high school Juniors and Seniors to introduce them into career opportunities in water. Low and behold, it worked! Our intern began the year wanting to be an actuary and is currently attending Wichita State University studying Civil Engineering. The City has been involved in the years following the pilot as an advisor for other Cities looking at hiring an intern. In addition to the above mentioned High School outreach we annually participate in Career Fair day to plant the seed for careers in water. This year we are also participating in a Career Day for 5th and 6th grade students. Our University outreach is something we find beneficial to both agencies. Our most recent partner, the University of Kansas, is pouring through some of our data in an effort to find a solution for excess P accumulating on our land application sites. Undergrad students used the data to build models as a class project and the Graduate students further expanded on the data and presented their findings at WEFTEC 2018.

<sup>13</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>14</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>15</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

The WRF has gone to great lengths to establish environmental processes that can be beneficial to the community as well as a model for other applications. Utilizing Wetlands saved the City two million dollars during construction and are used to treat high flows during rain events. High flows are diverted to the Wetlands and treated in the individual cells eliminating the need for concrete basins and pumping equipment to treat the raw water back to the treatment plant once the flows subside. The symbiotic relationship the wetlands provided for Wildlife is priceless. We also implemented best management practices (BMP's) in the form of buffer strips around all of our crop land abutting the river. The City is able to use this as a show piece when talking to landowners around our watershed to encourage some of the same practices we have utilized. Having a place that demonstrates visually how these buffer strips work is a huge asset. These practices were instrumental in receiving the Environmental Project of the Year at both the State and National level in 2008.

The City has also been proactive when it comes to resource recovery. Currently staff is turning solids by-products into Class A EQ Bio-solids. We accomplish this by building windrows and composting the solids as they come off the centrifuge. Due to the classification of our Bio-solids we have great flexibility to give some of them away to citizens in and around the community as well as use it as fertilizer on our adjacent farm ground. Along the same lines of reuse the treatment plant has dedicated equipment that uses non potable reuse water around the facility. Some of the uses include irrigation for the grounds, wash down hydrants, and equipment flush water. We are constantly looking for ways to capture and utilize reuse waters. Some of the ideas we have explored include harnessing reuse and installing drip irrigation within our farm fields. The capital to make this happen is something we continue to fight an uphill battle against with the size of our Utility. Another idea is the feasibility to provide reuse water for cooling towers at the local refinery. Recently the City has taken steps to make this a reality and have hired an Engineering firm to look at the possibilities to retro-fit the old wastewater plant to accommodate clarified raw water. If this looks reasonable I think the next step would be to consider blending treated wastewater effluent to help offset demand. These ideas are still conceptual at this point, but I think shows our outside thinking and desire to utilize our resources. Our capture of resources does not end there as we also were the first treatment plant in Kansas to explore Wind power as a viable source of renewable energy. In 2012 a 1 MW Turbine was installed on site with the capacity to power the entire facility. This forward thinking of green economy is something I hope we can continue to explore in the years to come.

Continuing education for operators and leadership training for management is something the City has always supported. For this reason the forward thinking and innovative mindsets of the future are being cultivated today. My personal succession planning has included Leadership Butler, University of Kansas Certified Public Managers Program, and the Water Leadership Institute. With each class I have come away with many new contacts and ideas. In addition to the above programs, the City has encouraged me to obtain additional certification throughout my career to better enhance learning of Water as a whole, not just any one single aspect. Empowering those around me to develop themselves into great operators and leaders is something I have embraced as I look forward to the next step in my career and encourage others to do the same. All of our operators are WEF members and active in our local MA.

In summary, leadership and staff are committed to engaging the community, employee development, outreach, innovation, and preserving the future of our resources as we represent a "Utility of the Future" in every sense of the word.

### **Application Part 3: Activity Area - Partnering and Engagement:**

Social Media presence to engage Community as to what's happening within the department

Work-in-Water/Career Fair/Water Festival, educating high school students the value of water and career opportunities

Partnering with University Research teams

## Involvement with Industry organizations and Community

The Wetlands and Water Reclamation Facility (WRF) has developed a positive reputation among our community as well as across the State thanks to dedicated employees. The success of the treatment plant is a testament to this dedication and industry involvement. We are a familiar face at annual conferences and a useful resource for fellow operators. Certification and continuing education is something the City is passionate about and are currently brainstorming how certification can impact Collections and Distribution staff. We consistently welcome facility tours varying in size and age groups. These tours introduce people to the world of wastewater, the environment, and microbiology. We want people to get to know wastewater so when we need financial support they understand where their dollars are going and why. The growing use of Social media has spurred our posting frequency over the last year. The more people know, the more engaged and invested they become. We find that this can be a great tool to reach our customer base. We have a great commitment to customer service and providing value with their concerns. Partnerships are very beneficial as financial resources and expertise are scarce. Providing students with data and receiving valuable conclusions in return are a win-win.

How did you go about implementing the practices/activities/programs that you described in your Overview paragraph?

Our first and foremost engagement strength has been support from Leadership to allow continuing education and Industry involvement ranging from Conference presenters, Committee chairs, Board of Directors, even Past President of the Association. This allows us to share our successes with fellow operators and brainstorm new ideas or troubleshoot issues as a familiar face. Our Superintendent was just nominated as Vice-President of KWEA marking our second City employee to take on this honor for the Association. In addition to giving back to our local MA a new program was started with grant money received by the Kansas Department of Health and Environment, administered by Kansas Municipal Utilities in the form of Operator in training (OIT) technical assistance. One of our employees currently spends time providing technical assistance for day to day operations as well as provides study material to help new operators gain certification of their own. City employees are also encouraged to obtain additional certification through the Association of Boards of Certification for career advancement and current job effectiveness.

We have always welcomed tours but have taken a more direct approach of inviting different organizations out to learn about wastewater. As a result, word of mouth has spread and we are receiving more requests for tours and engaging the community and making a bigger impact.

Social media has been slow to catch on with no one really dedicated to post at a frequency that keeps viewers engaged. We have since hired someone with a little more savvy and hope to tap this resource more fully in the future. Over the past year the City spent some time giving our website a much needed update.

The WRF is a model facility and a great place to showcase wastewater. It seemed only natural to partner with our surrounding Universities in an effort to build a platform far reaching of our own community. There is great value in the research the students have done,

and we are happy to provide the data necessary to foster their learning. Being a host site for Work-in – Water was a great experience and something we have continued to offer at our local high school to introduce students to careers in water. In an effort to expand our outreach beyond one event we have also been a part of career day at the high school in recent years. The Water festival is a piggy back opportunity for us to give tours as 4th grade students spend the day doing a variety of water activities.

What type of resources were needed to support implementation? (e.g., financial, staff, other)

WRF has a team of five employees operating the plant. We wear many hats throughout the day beginning with operation and maintenance. We handle all tours including scheduling and prep material. Social media blasts are updated by our Utility Admin Assistant. Our continuing education for operator’s annual budget is \$5,500 used for travel and conference fees.

This past year we submitted a LIFT SEE IT application to help fund travel expenses to see if an economical dryer would be feasible to implement in our system that would allow us to provide a product for a local fertilizer company while also solving our P accumulation concerns on surrounding land applied crop ground.

Did you partner with other stakeholders or organizations as a part of your implementation process?

The Natural Resources Conservation Service, Kansas Department of Wildlife and Parks and Tourism, Butler County Community College, are all partners for the Water Festival held each year. Wichita State University in addition to the University of Kansas are our Career and Research partners respectively.

The WRF also partners with KWEA and the Kansas Department of Health and Environment to present continuing education credits for fellow operators.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Just having enough able bodies to complete the daily tasks while also giving public outreach the attention it deserves. We hired part time seasonal help in the summer to relieve the operations work load giving us some flexibility to incorporate different ideas to really give visitors an experience they will remember.

Has “SMART” information technology supported your implementation/optimization in this area? If yes, please describe.

Not at this time, but I have some ideas how we can start implementing these technologies.

Where could other utilities go to find additional information on the Activity Area or the activities/practices/programs that you implemented?

Other utilities can visit our website and social media accounts to find information about our facility, tours, and projects from the ground floor.

<http://ks-eldorado.civicplus.com/130/Public-Utilities>

[www.facebook.com/EIDoradoPublicUtilitiesDept/](http://www.facebook.com/EIDoradoPublicUtilitiesDept/)

[http://webs.wichita.edu/?u=efc&p=/project\\_pages/work\\_in\\_water/](http://webs.wichita.edu/?u=efc&p=/project_pages/work_in_water/)

<http://www.people.ku.edu/~bmcswain/index.html>

<http://www.kwea.net/>

### Performance Measures & Results

Measure What are you measuring?	Targets What was your goal/intended outcome?	Outcomes What were your actual outcomes?
WRF Operations	To receive Plant of the Year accolades	Waiting on selection process for current year.
Tour participation	At least 3 new agency tours	Our new agencies for 2019, Oil Hill Elementary, First Baptist Day Care, Local Boy Scouts
Social Media followers	Better utilization	Increase of 150% over the last year

Community Involvement	Survey Response	13.4% response rate, with direction to move forward with.
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# City of Fayetteville, AR

## Energy Regeneration and Recovery



### Application Part 1: Background Information

<b>Utility Description (combine all plants if a multi-site system)</b>		
Utility Name: City of Fayetteville Water Resource Recovery Facilities		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Multiple Plants		
Service Area (square miles): 125	Average Annual Daily Flow or Demand (MGD): 14.1	
Population Served: 100,000		
<b>Location</b>		
Street Address: 1400 North Fox Hunter Rd		
City: Fayetteville	State: Arkansas	Country: USA
Zip Code/Country Code: 72701		
<b>Utility Representative Contact Information</b>		
Name: Tim Nyander	Phone: (479) 575-8386	Email: tnyander@fayetteville-ar.gov
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name: Greg Weeks Jeff Hickle	Title: Manager of Projects Environmental Projects Specialist	Contact Information (phone or email): (479) 443-3292 , <a href="mailto:greg.weeks@jacobs.com">greg.weeks@jacobs.com</a> <a href="mailto:Jeff.hickle@jacobs.com">Jeff.hickle@jacobs.com</a>

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today?

2016, 2017 & 2018

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>16</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>17</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>18</sup> ( IGP)

## Application Part 2: Organizational Culture

Creative solutions and technologies energize Fayetteville's future

As a previous awardee of the Utility of the Future Today, the City of Fayetteville has demonstrated a steadfast commitment to creating the best possible water and wastewater utility to serve residents now and for many years to come. Our goal is to invest in technologies, resources and strategies that help assure the livability of our community and the well-being of the nearly 100,000 residents of Fayetteville and its surrounding communities.

This year's Utility of the Future Today application chronicles our efforts to assess the city's energy needs and find innovative ways to meet those needs while reducing resource use and minimizing negative impacts to land, water and air. Fayetteville's recent work to develop an alternative-energy source is a step toward its goal of converting all city facilities to 100-percent clean energy by 2030. This project is closely associated with the City's wastewater utility, because Fayetteville's two wastewater-treatment facilities (known as water resource recovery facilities, or WRRFs) consume much of the energy the City uses each year. By developing two solar arrays on a combined 87 acres near the two WRRFs, the City will offset the energy used by the facilities, and still return additional energy to the generation and transmission grid. This one project will bring the City's clean-energy usage from its current 16 percent to 72 percent.

Since beginning our journey with the Utility of the Future Today program, we have identified and documented the areas where we believe Fayetteville excels as a professional and community leader. We also have showcased examples where technology improvements and innovative management approaches have supported the city's growth and kept pace with changing needs, all while achieving cost-effective and sustainable operations. We are fortunate to work with city leaders, staff and technical professionals who understand the need to adjust approaches and apply technologies to meet our common goals. Thus far, we have worked cooperatively to reduce energy and fuel use in biosolids management, evaluated and enhanced energy efficiency throughout the water-wastewater utility, designed and implemented a distinguished land-management program and supported watershed management initiatives that serve all northwest Arkansas. As we continue seeking ways to serve our citizens more effectively, Fayetteville is

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<sup>16</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>17</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>18</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

adopting renewable technology for energy generation and recovery. We believe this is the logical next step in our quest to secure a future of high-value service and sustainable operations.

### **More on organizational culture and context**

The City of Fayetteville's Utility Department operates with a focus on continuous improvement and innovation for sustainable natural-resources stewardship. The City's commitment to this important vision is evident as it identifies and applies technology and progressive thought in everyday utility services.

The Utility Department has helped advance Fayetteville's objective of enhancing sustainability in services to citizens, as established in the city plan. Sustainable enhancements started nearly 20 years ago, with simple behavior and operational changes. These have progressed to application of innovative technologies in key areas. Utility Department leadership has been fully engaged in the analysis, planning and implementation of numerous successful program upgrades.

For example, Fayetteville's partnership with Jacobs for wastewater treatment operations and maintenance has been a key conduit for numerous innovations and successes. These range from nutrient-load reductions, to energy-management to wetland restoration and habitat improvements. 42 Jacobs professionals operate Fayetteville's two WRRFs and their associated utilities and services—industrial pretreatment coordination, lift stations operation, and biosolids management. Fayetteville benefits from the skills and abilities of the onsite staff, and from a vast network of knowledge and services available from Jacobs engineers and technologists worldwide. Jacobs and Fayetteville share key organizational traits including an inclusive and participatory management approach and a collaborative spirit that encourages input from all staff to optimize operations and business systems to produce the best possible products and outcomes.

Fayetteville and Jacobs initiated their partnership in 1987. Jacobs helps the city sustain cost-efficient utility operations and rate stability. These are key elements of Fayetteville's high standard of living, and its multiple recognitions for livability and economic vitality by news outlets such as CNBC and U.S. News and World Report. The Utility Department's engaged management and operating philosophy embrace challenge and positive change. Adopting new tools and methods, such as the renewable energy enhancements discussed in this application, and working to assure they yield maximum benefit, have positioned the department and the city for a successful future.

### **Application Part 3: Activity Area - Energy Generation & Recovery**

In 2018, the City of Fayetteville's two WRRFs safely released more than 5 billion gallons of reclaimed water into Northwest Arkansas' (NWA) White and Illinois River watersheds. These two watersheds comprise nearly 90 percent of NWA's area, and include many of Arkansas' healthiest and fastest-growing communities—Fayetteville, Springdale, Rogers, Siloam Springs, and a portion of Bentonville. The White and Illinois Rivers are critical resources for public health and recreation. The impoundment of the White River forms Beaver Lake, located in the Ozark Mountains, which has a surface area of 31,700 acres. In addition to a popular recreational destination, Beaver Lake is NWA's primary drinking water source, serving a population of nearly 550,000. The Illinois River, whose headwaters begin in the NWA region, is recognized as one of Oklahoma's most valuable water resources and is designated as an Oklahoma State Scenic River. The impoundment of the Illinois River forms Lake Tenkiller, which also serves as a key wildlife, recreation and drinking water resource.

The City of Fayetteville has a longstanding record in the NWA region of community leadership in all aspects of environmental stewardship. The City is focused on becoming a resource-efficient community that meets present needs without compromising future generations' opportunities for health, well-being, and prosperity. In early 2018, Fayetteville's City Council adopted its Energy Action Plan, which represents a major milestone in the city's deliberate pursuit to reduce greenhouse gas (GHG) emissions through city- and community-led programs and projects. ([www.fayetteville-ar.gov/3234/Climate-and-Energy](http://www.fayetteville-ar.gov/3234/Climate-and-Energy))

In addition to their stewardship role of safeguarding public and aquatic health within the White and Illinois River watersheds, the City's WRRFs represent approximately half the City's annual greenhouse gas (GHG) emissions. Furthermore, electricity is the single largest cost of the WRRF operations.

Shortly after the Energy Action Plan's adoption, city planners began advancing toward the committed goal of achieving 100-percent local government clean energy by 2030. This ambitious clean energy goal will be an important benchmark towards the city achieving the greater goal of 100-percent community-wide clean energy by 2050! At the end of 2018, the City Council unanimously approved a trilateral agreement between the City of Fayetteville, Ozarks Electric Cooperative and Today's Power, Inc. for development and construction (in 2019) of Arkansas' largest renewable energy system on municipal property capable of utility-scale power production.

The City's Solar Array Project will comprise a total area of approximately 87 acres. About 49 acres of solar-panel arrays will be located with the White River watershed, near the city's Paul R. Noland WRRF. Another 38 acres of solar-panel arrays will be located within the Illinois River watershed near the city's West Side WRRF. The arrays consist of 10 megawatts (MW) of solar power generation and associated 24 megawatt hours (MWh) of energy storage, a first in Arkansas, at Fayetteville's two WRRFs. The project consists of 5 MW of ground-mounted solar photovoltaic panels and 12 MWh of battery storage at each facility. Solar panels will be installed on a sun-tracking system to enable maximum solar exposure throughout the day. This will translate to an approximate 15-percent increase in electricity production by the solar array. The arrays will be capable of generating 18.3 million kilowatt hours of renewable energy per year. They can offset approximately 103 percent of the WRRF's electrical demand. Developing the solar arrays will increase the City's clean energy ratio from its current 16 percent to 72 percent. Construction of the Solar Array Project began in spring 2019 with completion and system startup scheduled for summer 2019.

### **Question and Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

**Answer:** The City worked with Ozarks Electric and Today's Power, Inc. to negotiate, design, and implement the solar facilities at each WRRF.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

**Answer:** The City's cost was \$716,000 in capital. In addition to staff contributions from multiple departments (Water & Sewer, Engineering, Sustainability, WRRF Operations) the City provided land for the projects.

Did you partner with other stakeholders or organizations as a part of your implementation process?

**Answer:** The City partnered with Ozarks Electric Cooperative; Today's Power, Inc.; Arkansas Public Service Commission and Jacobs Engineering Group Inc.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

**Answer:** The most critical obstacle was executing an agreement that provided maximum ROI to the City, including taking advantage of federal solar investment tax credit (ITC) for the project. We were able to work with the utility company, Ozarks Electric, and the solar developer, Today's Power, Inc., to arrive at a trilateral agreement that yielded maximum benefit for each entity.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

**Answer:** The solar array utilizes a sun tracking system to maximize daily solar exposure; this technology adds 15 percent to the system’s energy production. The system also is equipped with 24 MWh of battery storage for excess energy that can be used during peak energy consumption periods. This enables Ozarks Electric to save costs by allowing them to avoid purchasing electricity during expensive peaking periods. This is the first utility-scale battery storage project in Arkansas.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

**Answer:**

see Sustainable Fayetteville link,

<http://fayetteville-ar.gov/253/Sustainability-Resilience>

see Solar Array Project link,

<http://www.fayetteville-ar.gov/3234/Climate-and-Energy>

see Energy Action Plan link,

<http://fayetteville-ar.gov/3246/Energy-Action-Plan>

see Today’s Power link,

<http://www.todaypower.com/>

see Ozarks Electric Cooperative link, <https://ozarkselectric.tumblr.com/post/180331402789/fayetteville-moves-toward-100-renewable-energy-in>

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Clean Energy Generation & Recovery	100% City-based Clean Energy by 2030	Increase of Clean Energy ratio from 16% to 72%
Clean Energy Generation & Recovery	100% Community-based Clean Energy by 2050	City set region-wide precedent with solar-array infrastructure investment. Additional 18.3 million kWh/yr and 103% offset of city’s WRRF electrical consumption.
Funding approval of the Solar Array Project	On-time and Under-budget Project Delivery	City Council approval in 2018 Planned Construction 2019

# City of Grand Rapids, MI

## Partnering & Engagement



### Application Part 1: Background Information

Utility Description		
Utility Name: City of Grand Rapids		
Type: Single plant servicing a regional system, collection system, and stormwater.		
Service area: 137 square miles	Average Annual Daily Flow or Demand: 42 MGD	
Population Served: 11 communities / 277,030		
Location		
Street Address: 1300 Market Ave SW		
City: Grand Rapids	State: Michigan	Country: United States
Zip Code: 49503		
Utility Representative Contact Information		
Name: Kolene Allen	Phone: (616) 456-3684	Email: kallen@grcity.us
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
Current Program Members Only		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.		
<input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use (2016) <input checked="" type="checkbox"/> Activity Area 2: Partnering & Engagement (2016) <input checked="" type="checkbox"/> Activity Area 3: Energy Efficiency (2016) <input checked="" type="checkbox"/> Activity Area 4: Energy Generation & Recovery (2016 & 2017) <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery		

## Application Part 2: Organizational Culture

### Overview

The City of Grand Rapids is the second largest city in Michigan. The City is a regional provider of water, wastewater, and other public services to several municipalities in the area, serving a population of approximately 280,000 in 11 communities encompassing a service area of 137 square miles. The Environmental Services Department (ESD) manages the utility, including the Water Resource Recovery Facility (WRRF), stormwater management, city-wide green infrastructure, and air quality to preserve and protect the environment, maintain public health and safety, and improve quality of life.

In April 2019, we adopted an impressive four-year strategic plan to guide our work. Through digital town halls to engage the community and input from staff at all levels, the framework outlined in the plan is driven by a simple mission – to elevate quality of life through excellent City services. Our values are what we stand for. They are embedded in our culture and are the driving force for everything we do. Our core values are:

- **Accountability** - Always acting with integrity and transparency and being responsible for what we do and say.
- **Collaboration** - Working together in partnership with others; teamwork.
- **Customer Service** - Professionally serving those who live in, work in or visit the city.
- **Equity** - Leveraging City influence to intentionally remove and prevent barriers created by systemic and institutional injustice.
- **Innovation** - Challenging how things have been done before. Fulfilling community needs by offering new ways to serve our customers and enhance operations. Being nimble, self-aware and open to feedback.
- **Sustainability** - Making decisions with an understanding of how those decisions will impact the environment, people and communities, and finances, both today and in the future.

At the City of Grand Rapids, we aim to be nationally recognized as an equitable, welcoming, innovative and collaborative city with a robust economy, safe and healthy community, and the opportunity for a high quality of life for all. To achieve this high standard, we give our staff the appropriate tools and resources to offer excellent public service.

Our culture offers a workplace environment of continuous improvements, innovation, inclusiveness, collaboration, and initiative. Employees are encouraged to keep moving, remain passionate, and explore endless possibilities. We reinforce these traits and encourage growth through skill development, mentorship programs, and ongoing training. In recent years, this unique approach has led to several major projects within the utility to secure a positive future for Grand Rapids, while introducing our community to ideas that build a sustainable city. Embedding these practices and policies in our work is what's contributed to our success.

Current projects within ESD that demonstrate our commitment to these core values and mission include:

- Smart Community

As one of the most advanced utilities in the country, Grand Rapids is building a smart infrastructure to combat the challenges of city growth, environmental issues, and socioeconomic disparities. Leveraging big data and technology allows us to improve livability, workability, and sustainability. Some of these efforts include:

**Sanitary Sewer Model** - The model monitors real-time sewer conditions for flow, debris, and inflow & infiltration. Genetic algorithms are used to calibrate our existing hydraulic model. Our fact-based model, using sensors, offers a real-time condition of all pipes to certify SSO requirements. Real-time data paired with actual weather data has saved an estimated \$1 billion in sewer investment to reach SSO certification requirement. We plan to continue expanding the capabilities of this system in future projects to include predictive sewer collection system maintenance, cleaning, and the Fats, Oils and Grease program.

**Grand Rapids Air Quality** - A collaboration between public and private entities that aims to generate high-resolution air quality data. Low-cost air sensors are deployed across the city to collect data and relay information over a LoRaWAN (Long Range Wide Area Network) to a public database. That data allows for real-time decision making, sharing, downloading, and use by others including residents.

**LIFT for Management** - Utility Analysis Improvement Methodology (UAIM) is in use to explore how utilities, including those beyond Grand Rapids, might facilitate engagement in innovation and measure the impact engagement has on workplace culture. Working to identify effective engagement tactics, tools and success metrics, Grand Rapids is growing the effectiveness of utilities across the country by sharing this data. With other LIFT partners as well as WEF and WRF, we're developing guidance for forging effective utility innovation partnerships as well as developing and launching meaningful and transformative strategies.

**Real-time Controls** - The WRRF utilizes new tools such as zero angle photo spectrometers and real-time controls to efficiently monitor and control processes quickly and accurately.

**PFAS Destruction** Tackling the global problem of PFAS contamination head on, we've formed a unique partnership with Michigan State University-Fraunhofer USA, Inc. Center for Coatings and Diamond Technologies (MSU-Fraunhofer) to research and test the destruction of PFAS compounds in wastewater. MSU-Fraunhofer is utilizing boron-doped diamond electrode technology to break down the molecular bonds of the contaminants. The pilot program began in May of 2019.

**Concentrated Waste Pipeline** - The tremendous growth in the City of Grand Rapids means we must take proactive steps to address the increasing loads to the sanitary sewer system. A pipeline was installed at the WRRF for surcharge customers to discharge into a concentrated waste tank. Customers will also be allowed to transport concentrated waste for direct discharge to the tank. The concentrated waste is then introduced during off peak hours to level out the diurnal flow pattern of current pollutant loadings.

**Biodigester** - A biodigestion system is currently under construction and will be completed by mid-2020. The projected customer growth in the area, from food processing, breweries, and general economic expansion, would exceed the capacity of the current system within the next few years. To address the additional growth in a sustainable manner, biodigestion will be used to manage these higher strength wastes. This approach reduces Biochemical Oxygen Demand (BOD) loadings on the WRRF and moves the reduced loading to recycle streams. The biogas produced by recycling the available carbon (methane) created with the digestion system will be used to produce energy, primarily electricity, that can then be used to power and heat the buildings and operations at the WRRF.

**Phosphorus Recovery** - Phosphorous recovery is a part of the WRRF's commitment to operating a world-class facility, reducing costs, and protecting the environment. Once the biodigesters are operational we will be able to recover phosphorus from the digested sludge. This will keep the phosphate out of the watershed which can lead to eutrophication.

**Renewable Natural Gas (RNG) and Renewable Identification Numbers (RINs)** - Once the biodigesters come online, we'll recover the energy created by the anaerobic digestion process to create biogas and reduce carbon dioxide emissions. The biogas created will be refined and put into the existing natural gas grid to sell back to the natural gas system with RINs. We expect to have the first real-time gas conditioning metering application using our piloted sewer endpoint technology and our utility-industrial

IOT network, FlexNet. Also, there are discussions to create the first multi-community virtual and/or physical pipeline for conditioning to help other municipalities get to RINs.

**City-wide Green Infrastructure** - The City of Grand Rapids incorporates green infrastructure throughout the city whenever possible. This approach to water management uses natural or engineered systems that mimic natural processes to reduce water pollution and flooding, enhance overall environmental quality and provide sustainable utility services. The city also has a footing drain disconnection program and a goal to increase the tree canopy to 40% into the city's landscape, all to help to reduce water pollution and manage stormwater. This has been possible due to the overwhelming public and private support in our city. In fact, Grand Rapids was named "America's Greenest City" by Fast Company magazine, was the first city to be recognized by the United Nations as a Regional Centre for Sustainable Development in 2009 and has the most LEED certified buildings per capita according to The U.S. Green Business Council.

Grand Rapids was the first city in the country to create a Green Infrastructure Portfolio Standard (GIPS) to guide new construction and retrofits on reducing the volume and pollutant load of stormwater runoff in the city. Implementing GIPS allows quantification of the implementation of Green Infrastructure and is used to measure progress and impact on water quality.

### **Summary**

Highlighting just a few of our recent projects demonstrates the City of Grand Rapids ability to remain a Utility of the Future Today since being identified as one in 2016. Since that recognition, we strive to not only remain a UOTF but to advance our facility and services beyond. This means that we are committed to; investing in our employees and empowering them to take risks and set big goals; addressing the challenges that utilities face not just today, but tomorrow; and building partnerships and collaborations that have the most positive outcome for our community and the world.

### **Application Part 3: Activity Area - Partnering & Engagement**

Collaboration is one of the City of Grand Rapids core values. It's embedded in our work and is at the heart of everything we do. Our collaborative efforts ensure that we are involved with our stakeholders and engaged with the community. We intentionally seek partners and community input for most projects. We maintain ongoing relations through several collaborations like the Utility Advisory Board, Stormwater Oversight Commission, and Grand Valley Regional Biosolids Authority. Our efforts have produced some unique and powerful partnerships to serve the community. Highlighted below is one that will have a significant impact on Grand Rapids for years to come.

#### **Grand River Revitalization Project**

You'd expect find some rapids in the Grand River, but the sad truth is that they haven't existed since around the 1830s when the first dam was built, quieting the roar that impressed our early settlers enough to name the city after them. Almost 200 years later, that's about to change. A plan to restore the rapids was first pursued by Grand Rapids Whitewater, a non-profit founded specifically to lead the revitalization of a 2.5 mile stretch of the Grand River running through downtown. The ambitious vision quickly caught on and rallied the support of sustainably-minded City leaders. Now called the River for All project, the city is leading the planning process and actively engaging with all partners to coordinate the project. The Environmental Services Department (ESD) is governing the process with a goal of having a big impact on the environment. Not only are the rapids being restored, but along with them, habitat that was once the spawning grounds of the Lake Sturgeon will be reestablished. Highlights of the project also include dam removal, increased access points for recreation, and 7.5 miles of riverside parks, trails, and flood mitigation structures. There are over a dozen partner organizations working together on this project with the City.

A huge part of this project is planning and design. The City is relying on the expertise from partner organizations. For example, one hurdle the project has encountered is protecting the *Epioblasma triquetra*, commonly called the snuffbox mussel. This mussel has a symbiotic relationship with the perch of the Grand River, attaching their eggs to the gills of the fish so that the offspring can be dispersed along the riverbed. Its habitat has declined significantly enough to classify them as a federally endangered species in 2012. It lives in the Grand River, exactly where the large Sixth Street Dam needs to be removed to move the project forward. To ensure the safety of the mussel, work had to be placed on hold to conduct a study of the mussel and plan for their relocation upstream. High school students from the area helped inventory the population while learning about their role in the ecosystem of the Great Lakes region. The U.S. Army Corps of Engineers is currently working on an environmental impact statement, a large part of that has been outreach events to educate the community about the mussel and ensuring that there will be no negative impacts while under construction. We'll be working closely with the U.S. Fish and Wildlife Service to plan their move upstream, ensuring their survival.

As you can see, a strong leadership role was necessary to keep all the partners working together and give one unified voice to clearly communicate project updates and objectives to all stakeholders, including the community. With targeted outreach activities, we have been able to gain public input into the project and maintain public support of the river restoration.

Phase I of the project is in the final planning stages, with mussel relocation and coffer dam construction to commence in the spring. Construction and habitat restoration will continue through 2022. Phase II of the project is the construction of an adjustable hydraulic structure to prevent invasive species from moving into the Great Lakes. The final phase, removal of the Sixth Street Dam, will be done by 2025.

Partners of River for All include:

- Grand Rapids Whitewater
- Downtown Grand Rapids, Inc.
- Lower Grand River Organization of Watersheds
- Grand Valley Metro Council
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Services
- Great Lakes Fisheries Commission
- Wege Foundation
- Founders Brewing Co.
- Michigan DNR
- Grand Rapids Community College
- Grand Rapids Public Museum

The digital information hub for all activity related to the project can be found online at <http://riverforall.com>. This valuable tool includes site plans, progress updates, focus group reports, and an area to submit feedback. Information is distributed through press releases, community events, and social media.

### **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

The idea to restore the rapids was first outlined in the City's Green Grand Rapids Plan, a citywide green infrastructure master planning process. Six topics were outlined in the plan, with one focused on the Grand River. Specifically, the plan recommended changing the land use along the river to encourage

recreation along the riverfront and in the river, as well as a goal to pursue river and stream restoration. Grand Rapids Whitewater was formed as a non-profit to create the vision for the 2.5 mile stretch of the river running through downtown. Grand Rapids Whitewater's preliminary plan was unanimously endorsed by the Grand Rapids City Commission in 2014. At the same time, the Commission appointed a steering committee to coordinate efforts. Other organizations in the community embraced the project and offered their support, and working with Downtown Grand Rapids, Inc. the City identified 15 opportunity sites for public access, riverside trails, open space and neighborhood improvements. To carefully plan and coordinate the project, ESD was charged with overseeing the City's work on the project. As such, it is progressing under the City's coordinated efforts as it moves from the planning process to completeness.

What type and amount of resources were needed to support implementation?

One full-time licensed engineer within ESD is designated solely to the project, with support from other City staff.

The cost of the project is expected to be \$44 million.

Expert knowledge and support is required from several agencies, including Urban River Restoration (U.S. Fish & Wildlife Services), U.S. Army Corps of Engineers, Great Lakes Fishery Commission, engineering consultants, and scientists.

Community involvement.

Did you partner with other stakeholders or organizations as a part of your implementation process?

This is an ongoing effort. Initially the Green Grand Rapids Plan involved the input of nearly 20 organizations, over a dozen City staff, and a committee of 20 residents. Overall the extensive engagement included 4,500 participants. Moving forward, the project includes dozens of partnering organizations and anyone with a stake in Grand Rapids. We anticipate that involvement will continue to increase as more visible changes to the river occur and excitement builds.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

The habitat of the snuff box mussel was mentioned above, but another unforeseen obstacle emerged during the planning process - ensuring that a barrier remains to prevent the invasive sea lamprey, a parasite that can decimate the native fish population, from migrating downstream. The removal of the Sixth Street Dam means that the current barrier will also be removed. While this was an unintended benefit of the existing dam, we realized that it is critical to control the sea lampreys to preserve the ecosystem of the Great Lakes and its tributaries. Never before has there been an urban river restoration project with this type of complexity; with a requirement of protecting an endangered species while simultaneously controlling an invasive species. The unique approach and solution is only possible because of the large-scale collaboration efforts between the City and partners.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

Our work culture drives us towards emerging technologies. We intend to become a hive of Internet of Things (IoT) innovation through our Smart Utility - Smart Community initiative. Our Innovation Manager is currently focused on a smart watershed model. Real-time data showing the water quality index of the Grand River will be available via an online map. This infrastructure currently exists but shows monthly data, rather than measurements every two minutes as planned. It will also monitor and record data on rainfall, storm flows and water depths.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

River for All - <http://riverforall.com/>

River Restoration - <http://www.riverrestoration.org/grand-rapids-restoration.html>

ESD Facebook: <https://www.facebook.com/EnvironmentalServicesGR/>

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Funds raised from private, federal, state, and local agencies.	\$44M by 2020.	Currently at 74% with \$11M left.
Media Attention in last year	30 news publications.	42 news publications.
Successful prevention of sea lamprey migration upstream.	0	To be determined.
Successful relocation of snuffbox mussels.	Zero population loss and relocation to an area of the river where the mussel can thrive.	To be determined.
Improved river front property utilization and taxable values	Increase of \$100 million in taxable value of riverfront properties.	In progress.

# City of Greensboro Water Resources, NC

## Partnering & Engagement



### Application Part 1: Background Information

<b>Utility Description (combine all plants if a multi-site system)</b>		
Utility Name: City of Greensboro Water Resources Department		
Type: One Wastewater Treatment Plant (56 MGD design), One Sewage Collection System, Two Water Treatment Plants (52 MGD design), 1,511 miles water lines, 1,437 miles wastewater lines, 49 wastewater lift stations (70 miles of pressurized sewage force mains), 29 Significant Industrial Users, over 1500 Food Service Establishments		
Service Area (square miles):  Water Distribution 172.6 square miles Wastewater 175.2 square miles	Average Annual Daily Flow or Demand (MGD): Water Treatment 32.5 MGD (2018) Wastewater Treatment 35.3 MGD (2018)	
Population Served: 302,454		
<b>Location</b>		
Street Address: 2602 South Elm Eugene Street		
City: Greensboro	State: NC	Country: United States
Zip Code/Country Code: 27406		
<b>Utility Representative Contact Information</b>		
Name: Steven D. Drew	Phone: 336-373-7893	Email: Steve.drew@greensboro-nc.gov

### Application Part 2: Organizational Culture

City of Greensboro Water Resources Department (GWRD) is committed to providing high quality drinking water, sanitary sewer (wastewater collection) and stormwater management services to its

residents, businesses and other consumers/customers in neighboring communities. The Department actively partners with local, state, and federal agencies and other stakeholders to meet customer needs, regulatory requirements, protect public health and the environment, and improve the economic well-being of residents.

GWRD has an organizational culture that believes that today's sustainable infrastructure determines tomorrow's green environment. Therefore, GWRD encourages and actively sponsors sustainable innovation in the water resources industry and collaboration within the community. Our customer service and environmental protection mindset are exemplified in our mission and vision statements.

Part of our mission statement reads

We seek to maximize public trust in the provision of water, water reclamation, and stormwater management services that enhance public health and safety, minimize environmental impacts and protect water quality, and allow for economic sustainability and growth that our community desires.

Vision

Our vision is to be known for providing essential services to our customers that sustain public health with minimal environmental impact. Our actions will be guided by our steadfast commitment to and measured by our success in building public trust and the future we collectively desire as a community. Critical to our success is maintaining a work environment which fosters employee commitment to public service and making a difference in the lives of our residents. We uphold these tenets by providing excellent customer service to our customers.

WaterMARK of Leadership

GWRD is committed to creating an environment where everyone is valued and appreciated. We strongly encourage collaboration and exchange of information among teams, and sharing of ideas as we innovate, and apply cutting edge technologies that support our core water resources business.

GWRD's Leadership Team came to the realized that supervisors need a unified understanding of the Department's core mission and values. While the city's supervisory and leadership development tracks provide a good foundation, supervisory challenges or gaps remained. To address the identified gaps, the team collaboratively identified core competencies and branded the initiative as the WaterMARK of leadership. The purpose of WaterMARK is to provide development opportunities for supervisors and managers with five (5) developmental modules in the areas of Management, Accountability, Relationships and Key Performance Traits. In doing so, the goal of WaterMark can be achieved which is to develop leadership behaviors that demonstrate a culture of respect for City of Greensboro policies, core values, and one another.

Mentoring and Coaching

Our ability to transfer knowledge from top down, bottom up, and laterally among our team is focal to our success. The leadership team encourages transformational mentoring and coaching to reduce the possibility of a knowledge gap between new and experienced employees and potential knowledge loss due to retirement, career change, etc. We encourage knowledge sharing and transfer through formal and informal in-house trainings. Included in this mentoring and coaching is employee training on working together as a team to achieve a shared objective, conflict resolution, and stress management.

We strive to create an environment where everyone has the potential to perform effectively through feedback and coaching. Our leadership team utilizes an employee performance evaluation program that aligns with the City of Greensboro merit and compensation program. Employee performance is measured and employees receive a merit for meeting or exceeding the established business metrics necessary to achieving organizational goals.

## Environmental Stewardship

GWRD is committed to protecting the environment through prudent management of available and limited natural resources that allows the future generation to meet their needs. We do this by conducting energy-use audit of our plants and energy use in our operations, maintenance, and utility services tied to maintaining about 2,948 miles of water and wastewater lines.

In order to reduce operational energy use in our plants, we are specifying and replacing old and inefficient pumps, switch gears, transformers and other electrical equipment with energy efficient ones. Likewise, in our offices, we are upgrading lighting, and installing automated light switches in place of manual light switches.

GWRD recently completed a feasibility study that evaluated installing a solar PV farm at the wastewater treatment facility. The power generated will be used to help offset the cost of electricity required to operate the water reclamation plant. The solar farm has the potential of generating revenue for the department through Duke Energy's Power Purchase Agreement (PPA).

In our effort to reduce the Department's carbon footprint associated with our operations, we are using solar photovoltaic (PV) energy to power our road construction traffic control signals. GWRD installed fleet wide MyGeoTab Vehicle tracking and routing system (automated vehicle location system) to reduce driving time to respond to customers' request, and improve customer call response time. More efficient use of the Department's fleet carries the potential to reduce the amount of carbon emission to the environment.

## Community Engagement

As part of GWRD stewardship, we take into consideration the potential impact of our activities within our communities and neighbors. An example, "Randleman Dam" was developed and constructed through collaboration and partnering with the surrounding communities. We are also committed to partnering with the business community within our jurisdiction. It's our responsibility to educate our business community on the effect of their operation/activities on the environment, on our product and services, and overall quality of the life for our residents. Our industrial pretreatment program includes education, training, and sharing of new ideas (technologies and innovations) that will potentially help the business community make informed decisions. As part of our community outreach, the GWRD Industrial Waste Program invites all of our industrial partners to an annual Industry Day, a day that features breakfast, presentations by city officials, pretreatment staff, and other environmental professionals. Industries are recognized with awards presented for no violations during the previous one-year and five-year periods.

GWRD also hosts an annual "Water Festival," to educate students from elementary schools in the Guilford County School system on environmental protection and energy saving through water conservation. The Water Festival is also an avenue to inform students on potential water resources career opportunities. The Water Festival has taken place for 15 years and served approximately 300-400 students per event.

GWRD cultivates an open door policy with all stakeholders; internal and external customers, community leaders and elected officials. We strive to support everyone through information sharing and request for input on issues that matter to the public.

## Financial Management

GWRD is committed to sound financial management of public resources entrusted to our care. Our infrastructure capital improvement plans are focused on the vital and critical parts of our system to meet our customers' needs and our commitment to protecting the environment.

We continuously strive to improve our credit rating through highly efficient operational and capital planning and management. We have the highest credit rating of AAA with Standard and Poor's, and Fitch and an Aa1 with Moody Investment Services.

#### Capital improvement Projects (CIP)

GWRD actively plans for and manages the financial resources necessary to meet identified capital improvement needs; Capital Improvement Program (CIP) selections are made based on strong business/service case prioritization utilizing the following criteria:

- Infrastructure maintenance and upgrades;
- Meeting regulatory requirements;
- Capacity improvement;
- Operation effectiveness and system efficiency.

#### Team Building/Development

GWRD is committed to improving and developing our team of 355 employees that support our efforts across seven divisions. Our "Core Values" are: honesty, integrity, respect, and stewardship. These core values serve as the foundation for other employee training and development programs designed to enhance our team's effectiveness to serve our customers better.

Part of our team building portfolio includes continuous education and training to meet regulatory compliance, capacity building, and empowerment. We grant incentive rewards to encourage members to obtain regulatory and professional certifications relative to the water resources industry.

#### Wellness program

GWRD is equally committed to physical wellbeing of employees by providing an onsite gym for physical exercise in support of the City's organizational goals. Also considered important is employee financial wellbeing. We provide onsite financial education/training and information sessions to educate employees on critical financial matters and promote financial awareness.

#### Safety program

In 2007 Greensboro Water Resources earned NC Safety Star because we value and pursue innovation in safety. We have a formidable Safety Committee that meets on a regular basis, employee monthly safety training, and safety rewards and incentives. Members are encouraged and rewarded with personal time off and gift certificates for participating in any of the safety programs.

#### Recognition and Awards

GWRD excelled in many areas and has received many recognitions and awards which include, but are not limited to the following:

2013- Greensboro GWRD received "Partnership Award" from Duke Energy;

2015- GWRD received Disaster Preparedness Award from NC AWWA-WEA;

From 2014 through 2017, GWRD was recognized for Partnership for Safe Water by American Water Works Association, Association of Metropolitan Water Agencies, Association of State Drinking Water Administrators, USEPA, National Association of Water Companies, and Water Research Foundation.

### **Application Part 3: Activity Area - Partnering and Engagement**

GWRD prides itself on actively partnering and engaging the local, regulatory, and business community we serve. Specific practices that demonstrate our utility's outreach and engagement activities are listed below.

Partnerships in place with one or more community organizations with the partnership clearly branded and working toward specifically meeting articulated objectives (e.g., a formalized partnership among neighboring communities for addressing emerging contaminants detected in the community)

The Department offers assistance to other utilities in formal and informal partnerships (e.g. Haw River Nutrient Compliance Association)

Neighborhood group/community project participation to create recreational opportunities and enhance community assets (e.g., stream corridor maintenance)

Environmental education opportunities offered to community (e.g., Adopt-a-Stream, creek week and other clean-up events)

The value of water, wastewater, and stormwater collection and treatment's role in the social, economic, public, and environmental health of the community are actively promoted by the utility and its surrounding neighborhood communities

**Emerging Contaminants Stakeholder Engagement:**

Coordinated and partnered with six neighboring wastewater utilities and North Carolina Department of Environmental Quality (NCDEQ) to create an Upper Piedmont Emerging Constituents (UPEC) Workgroup to address emerging contaminants identified in the Cape Fear River basin by NC-DEQ

Developed a program for all local permitted industrial users to encourage voluntary self-monitoring and voluntary source reduction of 1,4-Dioxane, a contaminant of emerging concern

Coordinated and partnered with local industries in the watershed to solicit voluntary sampling or chemical inventory review to help identify sources of PFAS

**Industrial Community Partnership:**

Local limits pollutant trading program designed to fully utilize the WWTP capacities, which encourages economic development while still protecting the wastewater treatment facility and receiving stream

Annual recognition for industrial users who demonstrate 100% compliance with Significant Industrial User/Industrial User Permit discharge and reporting requirements. Currently 39 industries are eligible for the annual awards

Annual meeting to inform/update all industrial users on current regulatory issues

Pretreatment 101 training program for compliance assistance targeted toward new environmental contacts

**Nutrient Compliance Partnership:**

Coordinated and partnered with 3 other wastewater utilities to create the Haw River Nutrient Compliance Association (HRNCA)

The mission of the association is to work to preserve the water quality in the B. Everett Jordan reservoir by promoting and achieving compliance with the Jordan Lake Nutrient Management Strategy through the point source dischargers who comprise the membership in the association

Specific measures include the development of a framework to encourage cost-effective, creative solutions for development or enhancement of treatment facilities to ensure individual and group compliance with the Total Phosphorous regulatory limit established within the Haw River Arm of Jordan Lake

#### Professional Peer Educational Engagement:

Active participation and management of the following training schools: pretreatment program specialist (founding member), water and wastewater operator, collection and distribution, and maintenance technologist (founding member)

#### Environmental Education Partnership

Partnered with other municipal agencies to provide storm water education and outreach to targeted areas. Some of the outreach means include social media (Nextdoor), digital advertising, and traditional advertising

On-going environmental education and volunteer opportunities to the community including Adopt-a-Stream, storm drain markers, and other group clean up events. Provided professional development opportunities to local environmental educators and licensed teaching staff in Guilford County through the Project Wet Program

Actively participate in a variety of local, state, and national professional organizations that promote water quality including: Water Environment Federation, American Water Works Association, North Carolina AWWA-WEA, North Carolina Water Quality Association (founding member), North Carolina Pretreatment Consortium (founding member), North Carolina League of Municipalities, National Association of Clean Water Agencies, Water Resources Research Institute, Storm Water Association of North Carolina (founding member)

#### Stormwater Management

Community Engagement and Partnering to develop more environmentally friendly practices for the maintenance of publicly owned stream channels and the discontinuance of mowing inside stream buffers. The goal of the project was tied to reducing the cost of mowing of stream corridors and creating an ecofriendly landscape resembling a green-belt environment

#### Performance Measures and Results

All of the practices and activities that highlight our ongoing community partnering and engagement efforts were born out of a desire to continue to improve our community, demonstrate the value in the services we provide our customers and build on the relationships established with our stakeholders.

For example, the presence of emerging contaminants in our community was not only a concern for our utility but also for those communities located downstream of our watershed. By following the lead of NCDEQ, a working group consisting of neighboring utility providers was formed. In the meetings held by the workgroup, information, experiences, challenges, and proactive measures for addressing contaminants of emerging concern were shared. With the encouragement and support of NCDEQ Division of Water Resources and the formation of the Upper Piedmont Emerging Constituents (UPEC) Workgroup, we have had positive results on efforts to identify the sources and work toward reducing impacts on downstream water supplies.

As it pertains to the presence of emerging contaminants, the most critical obstacle that had to be overcome pertained to the lack of regulatory targets and guidance at the Federal and State level. To overcome this challenge, neighboring communities banded together with the goal of understanding the magnitude of the issue, identifying key stakeholders, and beginning the conversation around how best to

address the issue. In regard to 1,4-Dioxane, the proactive voluntary measures carried out by dischargers and indirect contributors resulted in significant reductions in the upper Cape Fear River basin.

Through ongoing dialog with NCDEQ, a comprehensive management strategy for 1,4-Dioxane in the Cape Fear River Basin has been established. The strategy will include detailed evaluation of point sources – including pretreatment evaluation and headworks analysis. A plan to look at major industrial sites as well as remediation sites will be included in the strategy. The management strategy NCDEQ is developing represents a long term effort to effectively manage the presence and impact of this contaminant in water supplies.

Activities tied to partnering with the regulated industrial community and the formation of the Haw River Nutrient Compliance Association (HRNCA) came about from a desire to form strategic partnerships, provide mutually beneficial educational opportunities, and demonstrate the role both entities and the Department play in the social, economic, public, and environmental health of the community.

A good example is Industry Day, an event that is held each year with the industrial users in the community. It was created as a means to share information, recognize compliance excellence, and educate new members on the importance of industrial pretreatment.

The most critical obstacle tied to ensuring the partnerships remain successful is linked to the transfer of (staff) knowledge and dedication of staffing resources. Through succession planning and the advanced allocation of resources these obstacles have been overcome.

For the compliance association, members realize the benefit (and security) of pooling individual nutrient allocation limits in the event one partner suffers significant operational issues that would make compliance difficult to achieve.

For activities tied to stormwater and environmental education, a desire to connect with and educate our residents, community groups, and businesses on the purpose and mission of the Department was felt. Community events, both created and existing, were utilized to help with the educational outreach efforts by Departmental staff members. Specific examples include the Department's annual Water Festival, Earth Day, Career Fairs, partnership with North Carolina Water Operators Association, Guilford County Girls STEM Program, local Sierra Club chapter tours, job shadowing, Schools Science Fairs, NC Agricultural and Technical State University WEF student chapter advisor, and middle and high school science classes.

The most critical obstacle facing the Department in relation to stormwater and environmental education dealt with the required level of staffing necessary to take full advantage of all of the outreach opportunities within the community. To overcome this issue, activities are prioritized based on the probable level of impact, prior success, size of audience reached, and feedback from staff and the community. The department actively canvases, promotes, and recognizes the volunteers who help to make these educational opportunities a success.

Through the aforementioned outreach efforts GWRD continues to emphasize the importance of environmental stewardship and activities or practices the community can adopt or participate in for the purpose of improving the community they live in.

The following table highlights specific performance measures, goals, and results tied to the practices and activities GWRD proactively demonstrates in support of community partnering and engagement.

## Performance Measures & Results

<b>Measure</b> <b>What are you measuring?</b>	<b>Targets</b> <b>What was your goal/intended outcome?</b>	<b>Outcomes</b> <b>What were your actual outcomes?</b>
Stakeholder Engagement: Emerging Contaminants - 1,4-Dioxane Reduction Plan	Determine source and reduce 1,4-Dioxane discharge to WWTP (resulting in less impact to downstream communities)	<i>Voluntary</i> actions by industrial users resulted in 80% reduction of 1,4-Dioxane discharged to WWTP
Partnering with Regulated Industrial Community Partnering with Regulated Industrial Community and NC-DEQ Partnering with Regulated Industrial Community	Industrial User Compliance recognition at annual Industry Day  Annual Regulation Updates Meeting (NCWQA)  Pretreatment 101 for New Industrial Contacts	25 Awards Issued in 2017 32 Awards Issued in 2018 (one 5-Year Award)  102 Attendees in 2017 94 Attendees in 2018  27 Attendees in 2018
Haw River Nutrient Compliance Association	Apply for and receive group NPDES permit for total phosphorus Achieve/maintain annual compliance	Permit Issued effective 1-1-2017 Compliant in 2017 and 2018
Wastewater education efforts provided to local community	Provide environmental education to various groups   Obtain community input on the repurposing of the North Buffalo Water Reclamation Facility	Participated in: Greensboro Water Festival, Earth Day, Career Fairs, NCWOA, Girls STEM Program, Sierra Club Tour, job shadowing, Science Fair, middle and high school science classes Four community engagement events held using an engagement toolkit to identify key elements the community and key stakeholders felt would provide a beneficial reuse of the decommissioned facility
Stormwater and general environmental education efforts provided to local community	Establish partnerships with community groups & school to provide environmental education on topics related to water conservation, stormwater education, and general environmental stewardship	Reached over 4,000 people in the Greensboro area, 2649 of these are school aged kids through partnerships with Stormwater SMART, Greensboro Swarm, Greensboro Science Center, Children's Museum, other internal city departments (Parks & Recreation – Waste Reduction). Outreach via social media to include 105,554 Impressions through Nextdoor messaging and over 7 million impressions across 5 digital media campaigns in 2018 Participated in Guilford Creek Week, reaching over 3900 participants, 42 bags of trash (6,030 pounds) and 248 pounds of medications collected by participants.
Stormwater Management	Established sustainable stream corridor maintenance practices	Planting of over 17,000 native trees along community stream corridors and the discontinuance of mowing inside stream buffers

# City of Pompano Beach Utilities Department, FL

## Water Reuse

### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: City of Pompano Beach Utilities Department		
Type 7.5 MGD Reuse Tertiary Plant and 35 miles of Distribution System		
Service Area (square miles): 26 square miles	Average Annual Daily Flow or Demand (MGD): 2.6 MGD Reuse	
Population Served: 83,380		
Location		
Street Address: 1205 NE 5 <sup>th</sup> Avenue (facility address 1799 North Federal Highway)		
City: Pompano Beach, Florida	State: Florida	Country: USA
Zip Code/Country Code: 33060		
Utility Representative Contact Information		
Name: A. Randolph Brown	Phone: 954-545-7043	Email: Randolph.brown@copbfl.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
Current Program Members Only		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? N/A		

### Application Part 2: Organizational Culture Narrative

The City of Pompano Beach Utilities Department began the journey of culture change in 2004 with the hiring of new management. It was apparent that the 20th century built utility was not designed to operate in this era. An assessment of the utility was conducted and areas requiring improvement were identified.

In 2005, job descriptions were revised to require a higher level of education that included technical and college credits. Highly skilled, competent and educated leaders are essential in making progress towards being a utility of the future. Continuing with our assessment efforts, the department hired consultants to develop master plans for each service area: water, wastewater, reuse, and stormwater. The master plans are updated every five years to prepare for new regulations, technology, climate change, and identifies capital improvement projects to strengthen our infrastructure. We instituted a comprehensive Capital Replacement Program to replace existing assets on a schedule that assisted with rate planning.

The first major culture change was the institution of a Safety Coordinator in 2006. There was a need to instill a strong safety ethic in the utility. From the top down safety was a primary job duty of every employee. During the onboarding process, employees are told four things: 1) they will never be asked to take safety short cuts, 2) They have the right to withdraw from a job if they sense that the task is unsafe,

3) No task is worth your wellbeing, 4) We want you to go home the way you came to work or just a little better. The effectiveness of the safety program is evident in our improved workers' compensation expenses from almost \$200,000 to currently \$20,000. The City of Pompano Beach utility department is one of the few utilities in Broward County with an employee dedicated to safety.

In 2009, a consultant was hired to conduct an Effective Utility Management (EUM) assessment to determine the utility's rating in each of the nine attributes. Also in 2009, staff developed the department's mission and vision statements.

Our Mission is:

“To provide superior utility service while creating exceptional value. Utilities provides water, reuse, wastewater, and stormwater services in an environmentally and financially responsible way with respect to the role of government in protecting the public's interest.”

Our vision is:

“To support the City wide vision and values by being an innovative provider of quality water utility services recognized for quality customer service; environmental stewardship; employee success and long term sustainability.”

In addition to our mission and vision statements, the utilities department uses the corporate values of the City: “respecting others, producing results, taking responsibility, flexibility and teamwork” as the basis for decision-making.

We created the position of Reuse Outreach and Water Conservation position in 2010. This position assists with the residential reuse connection program and is tasked with educating our customers on the benefits of reuse and water conservation. The City partners with Broward County on their NatureScape Irrigation Service Evaluation program to evaluate the efficiency of irrigation systems for large water users.

2011, saw the development of the position Utilities Compliance and Efficiency Manager. This position is responsible for 100% compliance with all applicable water, wastewater, reuse, and stormwater regulations at the local, state and federal level. The other duty of this position is to oversee the efficiency/improvement efforts of the department.

The City including the Utilities Department joined the Florida Benchmarking Consortium (FBC) in 2011. FBC allows the City to assess our performance against comparable utilities. In this same year, senior leaders attended an FBC conference and learned about Lean Six Sigma (LSS) from the Florida Power and Light speaker. They were intrigued by this process improvement methodology and went on to obtain their Green Belts from Florida Atlantic University (FAU) in 2013. Subsequently, the City developed a new strategic plan. The Utilities Department played a vital role in the development of this plan to establish the vision of the City in conjunction with the objectives needed to accomplish the vision.

In 2014, the Utilities Department created the position Asset Management Specialist. This position is tasked with the implementation of the asset management program by utilization of the Maximo software. Implementation initiated at the reuse plant in 2014 and is currently at 74% at the water treatment plant.

In May of 2014, White Belt Lean Six Sigma training was initiated for all employees. By the end of 2015, all 115 employees had a minimum of a white belt certification. Over the next year, all 15 senior leaders have attained their Green Belt and are equipped to lead process improvement teams. Employee job descriptions were modified to include the appropriate LSS training level.

Continuous improvement, increasing efficiencies and reduction of waste are the core focus through LSS in our department. The improvements made using the LSS methodology has allowed our department to

achieve our strategic plan goals, reduce time and cost in our processes and prevent rate increases. The utility department's performance is measured using a multidimensional approach such as benchmarking with FBC and AWWA and the application for industry awards/recognitions such as the Resilient Utility of the Year. Our department has received 37 awards for the Utility since 2013.

The most important asset in our organization is our staff. For this reason, our department has one of the highest training budget in the City which allows our staff to get the required training for them to be successful. The City also procured the services of a consultant to conduct ongoing Effective Leadership Development (ELD) training to equip current and future leaders. In an effort to prevent knowledge gaps and possibly a decrease in our level of service, the utilities department has implemented a knowledge retention program. In concluding, the City of Pompano Beach Utilities Department has been progressively preparing for the future by being trailblazers in our industry.

In 2017, our Fire Department was given the rating of ISO 1 from Insurance Services Office, Inc. (ISO). There are only 242 Fire Departments in the US. The Utilities Department took over maintenance of the fire hydrants in 2007 to increase the operability of the system.

Our reuse master plan is being updated in 2019. We are preparing the update with an eye towards the future focusing on new technologies that will aid in climate change and potable reuse.

### **Application Part 3: Activity Area - Water Reuse**

The City of Pompano Beach, a pioneer in reclamation efforts in Broward County, first considered the use of alternate sources of water as far back as 1979. The City along with other southeastern communities were facing increasing demands on potable water supplies due to rapid development. Saltwater intrusion into the eastern edges of the Biscayne Aquifer motivated the undertaking of several studies. These studies identified the potential for the use of reclaimed water for irrigation of the City's green spaces, consisting of approximately 400 acres of municipally owned golf course, ball fields and parks. At the time, 2.5 MGD of irrigation came from four shallow irrigation wells in close proximity to the City's eastern well field. These studies indicated that the use of reuse for irrigation in this area would not only conserve that same gallon for gallon amount of potable water but also abate salt water intrusion.

In 1989, the original (reuse facility only) plant was constructed with a 2 million gallon ground storage tank and a 2.5 MGD design flow rating. This was expanded in 2002 to 7.5 MGD design flow rating with expansion capabilities of up to 12.5 MGD. The site presently consists of: two filter structures, associated pumps, chlorine contact basin, two reuse water ground storage tanks (6 MG capacity), two dedicated distribution systems (high pressure system for the golf course and a low pressure system for irrigation of parks, medians, and residential customers), and a continuously monitoring SCADA system with telemetry to the water treatment plant for monitoring and control functions.

The reuse plant takes in a portion of the treated wastewater effluent from the Broward County Regional Wastewater Facility destined for disposal via the ocean outfall. This effluent is diverted from the Atlantic Ocean outfall (assisting with legislative mandates to eliminate ocean outfall by 2025) and is further treated to improve its quality via filtration and disinfection. Currently about 2.6 MGD is delivered for irrigation use, resulting in a comparable savings of potable water.

Initially in 1988, the reuse plant was to serve only the municipal golf course, four ball park fields and medians. Over the years the service area expanded to the Pompano Airpark, medians further north into the City of Lighthouse Point and finally to residential sections of the City of Pompano Beach and Lighthouse Point. Currently the City has thirty five miles of distribution piping and a growing customer base. The location of these lines were selected to assist with the remediation of saltwater intrusion. The City Code of Ordinances requires that all new residential communities must have dedicated reuse piping in place and all commercial accounts must connect to the reuse distribution system when it becomes available in their area.

With the implementation of the residential reuse program, new programs had to be developed and initiated to provide customer education and outreach. OASIS (Our Alternative Supply Irrigation System) was created. A contest was held for residents to create a logo and slogan for the City's Reuse program.

The winning slogan was "Making It Clean and Turning It Green." This first introduced the public to the many benefits of reuse. The City's other reuse informational efforts included: distribution of public education materials such as the Reuse Consumer Confidence Report; providing the public with information via the City reuse web page and TV channel; providing signage in irrigated areas; and conducting reuse facility tours in order to promote the benefits and importance of reuse.

When Pompano Beach first expanded availability to residential customers a special assessment program was instituted to assist single family residents with the cost for the hook up to the reuse distribution system. The reception was less enthusiastic than anticipated. Some of the hurdles hindering connections from the resident's perspective included: poor public perception of reuse, the process of the initial connection and dealing with a contractor, upfront costs and annual backflow inspections and fees.

We listened to the voice of the customers and instituted an innovative marketing program combined with competitive pricing and increased customer service to target potential customers in our reuse service area. Through our reuse program OASIS (Our Alternative Supply Irrigation System), the "I Can Water" campaign was launched to educate and attract more residents to participate in this conservation practice.

Under this program, the City connects single family residential customers in the reuse service area with no upfront cost to the customer. The connection costs were designed into the rates. The City contracts with local licensed plumbers to install a new dual check backflow device and make the connection to the customer's irrigation system. The plumbers even take care of permitting. This backflow device, provided and owned by the City, requires no annual testing and has no inspection fees as previously required. The City also takes care of all future maintenance and replacements of this backflow device, at no cost to the customer. We now have 955 residential customers and growing.

For the existing 73 residential customers, the City replaced the existing double check valve assembly and installed a City owned dual check device at no cost to the customer, eliminating the annual backflow inspections and fees.

To the left is "Squirt" who is our reuse mascot. We held a naming contest with a middle school to name our sprinkler head.

The City received the first and only variance to date in the State of Florida to allow reuse to be sprayed on salad crops that will not be peeled, skinned, cooked or thermally processed. This variance demonstrates the quality of our reuse water and the dedication of our staff. This took over three years attempting legislation, regulatory avenues and finally with our partners we were able to achieve this milestone.

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

The construction of our reuse treatment plant was included as part of our Consumptive Use Permit (CUP) from the South Florida Water Management District (SFWMD). To aid in the program's success, we secured alternative funding and the support of City Administration and elected officials. Our grants reduce the burden to the rate payer.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Staff reversed engineered the reuse connection program. We took all the major complaints and found ways to work those issues out of the connection program. This process took about 8 months and approval from our City Commission.

Then we hired a Public Relations Consultant to conduct surveys to determine how customers felt about reuse. They assisted with the development of the “I Can Water” promotion, website, and marketing tools. The distribution system has a budget for \$300,000 each year for expansion. Our Reuse/Conservation program budgets \$100,000 over 5 years.

Staff oversees and maintains the treatment facility, the distribution system expansion, and education of the public, provide tours of the reuse facility,

Reuse rates are set for the next two years, increasing 5% each year. The rate structure is set with inclining block rates to make it clear that reuse is a resource not to be wasted.

Did you partner with other stakeholders or organizations as a part of your implementation process?

We strive to partner with other agencies to create multijurisdictional reuse projects. The Utilities Department has partnered with Broward County (BC), South Florida Water Management (SFWMD) and Florida Department of Environmental Protection (FDEP) to provide grants towards the expansion of the reuse distribution system. A total of \$900,000 was obtained from the 3 entities mentioned above for the recent expansion efforts. BC also provided a grant in the sum of \$220,000 to assist with the launching of the City’s award winning “I Can Water” program.

The City’s reuse expansion into the City of Lighthouse Point is a multijurisdictional and multiphase project. There are a total of five phases resulting in approximately 500 new customers. This project will assist Broward County with the closure of the wastewater ocean outfall line. We wholesale to reuse to the County’s eastern service area.

We partner with Parkson to be the first utility on the world to install their DynaSand® EcoWash® Filters. These filters are a unique system that allows continuous filtration with intermittent sand washing. Operating in this mode, the system reduces the amount of reject water, increases filter performance, maximizes the airlift lifecycle, and reduces maintenance time. We have had visitors from all over the world. <https://www.parkson.com/products/dynasand-ecowash>

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

The biggest obstacle the City had to overcome is developing a plan to encourage and educate customers on connecting to reuse. This led to the development of the City’s “I Can Water” award-winning program. The implementation of this program allowed the City to connect single family residential properties to reuse with no hassles or upfront cost. The City has a dedicated outreach staff to continue the ongoing educational process. The City uses various medium to provide information to the community: TV channel, newspaper articles, magazine publications, websites and mailers. In 2011, the City had only 73 single family properties connected versus the 955 we currently have due to the success of this program.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

In 2011, the City installed an Automatic Metering Infrastructure (AMI). The City replaced over 19,000 meters including the reuse distribution system new meters that report back to our billing system. Customer will be able to see their usage online.

The City uses Supervisory Control and Data Acquisition (SCADA) to continuously monitor the quality of our reuse water and Maximo to ensure our assets are maintained as recommended by the manufacturers to ensure we maintain our established level of service.

As mentioned earlier, the installation of the Parkson filters aids in reducing backwash and is controlled by sensors in the operation of the filter.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Additional information can be found on the Utilities webpage of the City's website at [http://pompanobeachfl.gov/pages/ut\\_oasis/oasis](http://pompanobeachfl.gov/pages/ut_oasis/oasis) or the City's "I Can Water" website at <http://www.icanwater.com/>. <http://pompanobeachfl.gov/pages/utilities>

**Performance Measures & Results**

<b>Measure</b> What are you measuring?	<b>Targets</b> What was your goal/intended outcome?	<b>Outcomes</b> What were your actual outcomes?
Voluntary Customer Connected to Reuse	70%	74%
Offset potable water demands	839 Million gallons	100 MG
Expand reuse distribution system annually	2 miles	3.1 miles

Thank you for your time in reviewing our application and to the Water Industry.

# City of Rio Rancho Utilities, NM

## Water Reuse



### Application Part 1: Background Information

<b>Utility Description</b>		
City of Rio Rancho Utilities		
Water and Wastewater Utilities, 15 groundwater wells, 4 WW plants, 1 aquifer injection well		
102 Square Miles	12 MGD to 15 MDG	
Approximately 96,159 citizens (US Census population estimate as of July 1, 2017)		
<b>Location</b>		
3200 Civic Center Circle NE		
Rio Rancho	New Mexico	United States
87144		
<b>Utility Representative Contact Information</b>		
Jim Chiasson	505-896-8736	<a href="mailto:jchiasson@rrnm.gov">jchiasson@rrnm.gov</a>
<b>If application prepared by another entity, provide the information</b>		
N/A		
<b>Current Program Members Only</b>		
N/A		

### Application Part 2: Organizational Culture

The City of Rio Rancho (City) is the third largest city in New Mexico. Rio Rancho Utilities (RRU) provides quality drinking water to over 35,000 accounts and treats the wastewater prior to disposal via aquifer injection and storage or release to the Rio Grande. Rio Rancho is in the arid southwest high desert which receives an average of 8 inches of precipitation per year. RRU is composed of a combination of City staff and Jacobs, Inc. staff. The City contracts with Jacobs to run the water and wastewater operations. RRU has the following Mission and Vision Statements:

Mission Statement	Vision Statement
Through leadership, dedication, and integrity, we are committed to providing utility and environmental services of superior quality. We remain continually focused on the value of our associates, the well-being of our community and the preservation of our environment.	To be seen as a leader in our industry by setting a higher standard for environmental quality, by being good stewards of our water resources, and by providing superior customer service to our community.

**Business Focus**

Rio Rancho Utilities provides:

- Remove naturally occurring arsenic
- Fitch Ratings has affirmed an A+ rating on Rio Rancho bonds
- Dedicated customer success (service) staff
- Customer education on water use and water conservation
- Customers low-flow showerheads, toilet leak dye tablets, newsletters
- Student education on water use, treatment and conserving water
- Tabling events to further the mission of RRU
- Customers know and understand the value the water and call in street leaks with prompt response time

**Participatory Collaborative Culture**

RRU promotes a culture of collaboration by being active in various local, state and professional organizations. RRU shares information by attending and presenting at conferences and workshops, providing tours of the drinking water plants, wastewater plants, and the new aquifer injection site to interested groups and individuals. This collaboration is from the ground up – not just the upper management. For instance, the Water Conservation Specialists are part of the state-wide organization, New Mexico Water Conservation Alliance.

**Provides Formal or Informal Mentoring**

RRU has provided both formal and informal mentoring of youth for many years. RRU frequently has summer high-school aged interns to assist with day to day office-setting duties and has included these interns with summer youth and outreach programs provided by the Water Conservation Office. These interns have also gone on water audits with staff to learn how water customers can lower their water bills by finding and fixing leaks. RRU has accepted college interns through Work-Study programs at the local university and works to expose the college student to gain real-world experience within their study area, such as attending governing body and committee meetings for one intern studying Public Administration.

**Peer-to-Peer Relationships**

- RRU is a member of and has relationships with the following organizations:
- New Mexico Municipal League’s Environmental Quality Association (staff as president and board member)
- New Mexico Water Conservation Alliance (staff as president, vice president, and secretary)
- New Mexico Water
- American Water Works Association
- Water Environment Federation

- WaterReuse Association
- Rocky Mountain Section of AWWA and Rocky Mountain Water Environment Association
- American Public Works Association
- Groundwater Association
- Mid-Region Council of Governments' Water Resources Board
- Xeriscape Council of New Mexico (staff as secretary)

### **Awareness and Commitment to Workplace Safety**

- RRU has 783 days (as of 5/28/19) without a workplace accident.
- Tailgate safety meetings are held daily for the various field-work divisions.
- Quarterly mandatory safety meetings are required for every person.
- Monthly safety team are held with each field-work division heads who disseminate the information to their staff.
- Safety awards are honored quarterly: "Crew of the Quarter" and "Employee of the Quarter".
- Internal safety inspections are conducted and there is a dedicated safety officer at the site.
- City mandated safety training for each employee.

### **Application Part 3: Activity Area - Water Reuse**

Water Reuse is the Activity Area chosen for this application, specifically, the City's Aquifer Injection Project.

#### **Overview**

The Aquifer Injection Project was born as part of the City's reuse management strategy. This project is the first of its kind in the State of New Mexico and it is permitted to return up to 1 million gallons of purified water daily to the aquifer for storage and future use via a sixteen-inch diameter injection well drilled 1,700 feet deep.

#### **Questions & Answers**

RRU implemented the Aquifer Injection Project over a number of years.

- 2001 - The reuse management strategy journey began when the City of Rio Rancho Governing Body created the Water Reuse Strategy that included a plan to treat wastewater effluent and ultimately reuse 100% of the treated effluent within the City.
- 2002 - A citizen committee was formed to develop goals and objectives for managing the City's water resources in the future. This committee met monthly for two years.
- 2004 - The Water Resources Management Plan was produced by the citizen committee. Additionally, the Reuse Water Plan was completed and it directed what studies and pilot testing was needed prior to aquifer injection.
- 2005 - Two state of the art water reclamation facilities are built and they use membrane bioreactor (MBR) technologies to clean the wastewater. MBR technology has a 0.1 micron pore size to clean the water. Pilot testing assessed the effectiveness of using carbon adsorption followed by advanced oxidation to ensure complete pathogen die-off.
- 2007 - Injection pilot study is funded by State of New Mexico special appropriations grant and City funds.
- 2008 - Permit applications are submitted to the New Mexico Office of the State Engineer and the New Mexico Environment Department. As part of the permit requirements, the City's purified water for injection meets and exceeds water quality standards.
- 2010 - Sixteen-inch diameter injection well is drilled to 1,700 feet deep and five monitor wells are drilled.

- 2011 – Injection pilot study pumps nearly to 1 million gallons of potable water into the aquifer using the injection well for 30 days to study the direction and rate of the water flow. The study also showed a rise in the aquifer near the injection well and provided data to calculate when the water would reach the closest drinking water well.
- 2012 – 2014 – Reuse water lines are installed from the reclamation facility to the injection site and parks and medians along the route.
- 2014 – Concrete tank and pump station are built. The tank is designed to hold 3 million gallons and highly treated water is pumped from there to the injection site for further treatment prior to injection.
- 2016 – 2 million gallon concrete storage tank is built at the injection site. The Advanced Water Treatment Facility is equipped with ozone, ultraviolet, and biological granulated carbon for final water purification prior to injection.
- 2017 – The aquifer injection project is completed and injection began in July. Up to 1 million gallons a day of purified water can be returned to the aquifer.

The Aquifer Injection Project required the following resources for implementation:

*Financial:*

The Aquifer Injection Project cost approximately \$21 million dollars. The funding came from rate payers and grants/loans from the State of New Mexico.

Water quality testing required by the state is about \$50,000 per year.

*Staff:*

There are three dedicated-certified operators operating the Advanced Water Treatment Facility and Aquifer Injection.

*Other:*

There were several different contractors and engineering firms hired for the Aquifer Injection and Advanced Water Treatment Facility. Daniel B. Stephens performed the initial work including the pilot studies and the capability studies. The Advanced Water Treatment Facility was jointly designed by Daniel B. Stephens and Huitt Zollars and the major equipment was from Calgon Carbon and Xylem.

RRU partnered with several stakeholders and organizations for implementation of the Aquifer Injection project. Stakeholders include the New Mexico Environment Department and New Mexico Office of the State Engineer as regulators, as well as the City’s Utilities Commission and Governing Body. Additional stakeholders include the City’s citizen and business representatives from the committee formed in 2002. New Mexico state citizens and utilities are also stakeholders, as the Aquifer Injection Project was the first of its kind so everyone in the state has benefited by this project in one way or another.

There were no real critical obstacles to overcome, only minor ones:

- The permitting process through the State of New Mexico was lengthy because it was the first aquifer injection well in the state. The process for permitting was unclear to both RRU and the two state departments who permitted the project.
- Discovered “rust” in the pipes at initial start-up. The Calgon vessels were not coated and the steel piping was not stainless and also was not coated. When equipment was initially tested two years prior to start-up, the water should have been drained from vessels and pipes but it was left in them causing corrosion. The problem took several months to diagnose and several more months to go through City procurement and repairs.

- Iron bacteria was also discovered about the same time coating the two tanks (3 MG and 2 MG) and residing in the 5.5 miles of pipeline that runs from the MBR treatment plant to the Aquifer Injection site. It was determined that there was not enough residual chlorine for the 4 to 6 day residence time of the cleaned effluent prior to injection. The tanks were drained, cleaned and disinfected and effluent high in chlorine was passed through the 5.5 miles of piping for about two weeks to kill/flush the iron bacteria from it. The water was sent to the sewer system rather than injected into the well or wasted to the holding pond.

When RRU began the Aquifer Injection Project, “Smart” technologies were not available for use. Currently a SCADA system is used for several aspects of the Project for control and monitoring.

Utilities and other interested persons can go to <https://rrnm.gov/4024/Rio-Rancho-Pure> to learn about the Aquifer Injection Project.

**Performance Measures & Results**

Measure	Targets	Outcomes
Purified water injected per day	Up to 1 MGD purified water injected per day	450,000 gallons purified water injected per day. Worked with Carollo Engineering to “fine-tune” the processes, backwash, and injection settings to find the “sweet spot”
Citizen outreach and education prior to injection	Minimum of 10 newsletter articles on purification process and injection	16 newsletter articles from 2006 through 2016. Video made for Rio Rancho Pure posted on City website

# City of San Diego Public Utilities Department, CA

## Partnering and Engagement



### Application Part 1: Background Information

<b>Utility Description (combine all plants if a multi-site system)</b>		
Utility Name: City of San Diego's Public Utilities Department		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): City-wide water and wastewater system/regional system		
Service Area (square miles): 450 square miles	Average Annual Daily Flow or Demand (MGD): 180 MGD	
Population Served: 1.4 million water customers and 2.5 million wastewater customers		
<b>Location</b>		
Street Address: 9192 Topaz Way, MS 901A		
City: San Diego	State: CA	Country: United States of America
Zip Code/Country Code: 92123		
<b>Utility Representative Contact Information</b>		
Name: Tiffany Ngo	Phone: 858-614-5715	Email: <a href="mailto:ngot@sandiego.gov">ngot@sandiego.gov</a>
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b>		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  __ Activity Area 1: Beneficial Biosolids Use		

Activity Area 2: Partnering & Engagement<sup>19</sup>  
 Activity Area 3: Energy Efficiency  
 Activity Area 4: Energy Generation & Recovery  
 Activity Area 5: Nutrient Reduction & Materials Recovery<sup>20</sup>  
 Activity Area 6: Water Reuse  
 Activity Area 7: Watershed Stewardship<sup>21</sup> ( IGP)

## Application Part 2: Organizational Culture

The second largest city in California and eighth largest in the United States, San Diego boasts renowned parks and museums, beautiful sandy beaches and great weather. Its economy is built on thriving biotech, medical and tourism industries that draw millions of people to visit, work and live within the city. But the economy and quality of life that San Diegans enjoy depends on a reliable supply of water.

The City of San Diego's Public Utilities Department (PUD) operates one of the largest and most complex water storage, treatment and delivery systems. Not only does PUD provide 1.4 million San Diegans with safe, reliable drinking water, but we provide 2.5 million people throughout the region with wastewater service. There are approximately 280,000 potable water and sewer connections in the City of San Diego. PUD is also the wastewater provider for 12 agencies outside of the City of San Diego. With a large service area, PUD employs a team of more than 1,600 people dedicated to serving a world-class water utility. PUD's mission and vision are listed below:

**Our Mission:** To provide reliable water utility services that protect the health of our communities and the environment.

**Our Vision:** A world-class water utility for a world-class city.

PUD's slogan created by the employees is: Quality, Value, Reliability, and Customer Service - In Every Drop! Below are the four workforce commitments mentioned in our slogan that represent the PUD organizational culture:

*Quality:* we surpass quality and safety standards.

*Value:* we operate and invest wisely.

*Reliability:* we consistently provide dependable services.

*Customer Service:* we are responsible, professional and courteous.

### Training Opportunities

PUD is truly a "learning organization," prioritizing professional development for its 1,600+ employees. PUD provides an efficient, proactive training program that supports employees in meeting the department's goals and objectives by promoting individual development and organizational effectiveness through the delivery of educational opportunities, resources and services.

The PUD Training Section is one of a few select government agencies certified by the International Association for Continuing Education and Training to offer Continuing Education Units (CEU) via internally developed curriculums. This accreditation is recognized by the American National Standards

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<sup>19</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>20</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>21</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

Institute and enables PUD to internally support the renewal requirements of the more than 400 industry certifications maintained by staff. Below is a list of sample certifications:

- State Water Resources Control Board (SWRCB)
- Water Distribution Operator
- Water Treatment Operator
- Wastewater Plant Operator
- California Water Environment Association (CWEA)
- Advanced Water Treatment Operator
- Collections System Maintenance
- Electrical/Instrumentation Technician
- American Water Works Association California-Nevada Section (AWWA)
- Cross Connection Control Specialist
- Backflow Prevention Assembly

Conservative estimates place an annual savings of \$500K annually through the removal of registration fees, travel, shift coverage, and other variables associated with certification training requirements. There is also the unquantifiable measure of facilitating the core curriculum on PUD systems and equipment, especially during the field and hands-on training exercises.

The Training Program also supports employees in other job-skill related areas aside from CEU requirements. The robust training catalog includes dozens of courses that focus on improving an employee's skillset in the following areas: supervision, communication, computer programs, safety, technical, professional growth and overall development. The course catalog and training opportunities are accessible to all PUD staff via the SAP- Success Factors Learning Management System. The below data represents all training sessions completed by PUD staff in 2018:

- Training sessions offered: 112
- Individual staff members trained: 1,244
- Course completions: 13,518
- Training hours: 41,370
- Contact hours: 13,875
- CEUs: 1387

The PUD Training Program is constantly researching industry trends in terms of new technologies, best management practices, innovations and learning styles. These trends are then either incorporated into existing trainings or utilized to generate brand new programs, such as the Advanced Water Treatment Operator Certification Series.

#### Employee Recognition

Employee recognition is a top priority for PUD. Opportunities for recognition include the following:

- **The High 5 Recognition Program.** Employees can nominate a co-worker for doing a great job at work. Along with this recognition, they become eligible for a monthly drawing for gift cards. More than 2,106 High 5s have been submitted so far in 2019. High 5s are a great tool to boost morale, show fellow colleagues appreciation and commend them on a job well done.
- **Catch Me in Action.** A special effort to promote recognition. Employees take photos of unique, diverse functions in their division, and five to ten photos are selected for collages.
- **Certificates of Recognition.** Saying thank you for doing a great job.
- **Pipeline Employee Spotlight.** One employee is featured in the monthly employee newsletter, Pipeline, distributed to the entire Department staff and others in the City interested in PUD news.

- **Employee of the Quarter (EoQ).** One to two employees in each Division are selected through a nomination process to become EoQ. Certificates of Recognition and discretionary leave are provided to each winner.
- **Employee of the Year.** One employee is selected from the group of EoQ recipients to represent the Department in the Citywide Employee of the Year Program. A certificate of recognition and Discretionary Leave is awarded to the winner.
- **Years of Service Award.** Employees are recognized for their commitment and dedication to the City/Department. Awards are issued at 5-year intervals include tokens of appreciation and discretionary time off. This assists in knowledge transfer as it pertains to operations.

### **Application Part 3: Activity Area - Partnering and Engagement**

The City of San Diego PUD invests in ongoing community outreach and engagement efforts to ensure that its customers are accurately informed about their water supply. In 2010, PUD launched a comprehensive education and outreach program for Pure Water San Diego, a phased, multi-year potable reuse program that will provide one-third of San Diego's water locally by 2035.

The Pure Water outreach program is ongoing and includes a wide variety of community engagement activities, including free guided tours of the PUD's 1 mgd Pure Water Demonstration Facility, speakers bureau presentations to community organizations, a youth outreach program, informational booths at community events, social media and web engagement, and community partnerships and working groups.

In 2016, PUD begin preparing for the next phase of the Pure Water outreach program--targeted outreach to businesses and residents in the communities that would be impacted by future construction of the Phase 1 - North City projects. In 2018, four community-specific working groups were created to gather recommendations on how to minimize community construction impacts.

Pure Water's extensive outreach program, which now includes both ongoing program-level outreach and construction relations activities, is a model for other agencies and has cemented San Diego's reputation as a leader in potable reuse. PUD has won awards from the following organizations for Pure Water's outreach efforts:

- Water Reliability Coalition
- American Water Works Association
- California WaterReuse Association
- Association of California Water Agencies
- California Association of Public Information Professionals
- California Association of Environmental Professionals
- American Planning Association San Diego Section
- Public Relations Society of America
- Public Relations Society of America San Diego/Imperial Counties

### **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

PUD, with support from a community outreach consultant, developed a written communication plan outlining the development of a speakers bureau for community presentations, informational materials (including those for multicultural audiences), community event participation, social media, a dedicated website, and an educational tour program for the Pure Water Demonstration Facility.

PUD employees serve as Pure Water Demonstration Facility tour guides, speakers bureau presenters and community events staff. The Pure Water outreach team is comprised of a diverse range of employees

including engineers, policy analysts, marine biologists, treatment plant operators, chemists, and more. PUD hosts speaker training sessions for employees interested in supporting Pure Water outreach. Outreach staff receive training on the Pure Water Program's key messages and how to engage the public.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Two community outreach consultants are based on site at PUD's offices to implement Pure Water's outreach and education program. Multicultural outreach consultants engage San Diego's Asian, African American and Latino communities. City staff time is used to support staffing of Pure Water Demonstration Facility tours, speakers bureau presentations and community events.

Additionally, a program management consulting firm oversees implementation of the entire Pure Water Program. PUD recently procured two construction management consultants to assist with the oversight of Phase 1 construction, one for treatment projects and one for conveyance projects. These engineering consultants contribute to outreach efforts through by attending working group meetings, staffing community events and more.

Did you partner with other stakeholders or organizations as a part of your implementation process?

PUD wanted to emphasize the importance of water in local products that San Diegans value, such as beer and coffee. PUD has leveraged unique partnerships with local businesses reliant on a secure and sustainable water supply to showcase the safety of purified recycled water.

In March 2017, PUD partnered with Stone Brewing to brew beer using purified water produced at the City's Pure Water Demonstration Facility. The limited-edition beer, named "Full Circle Pale Ale," was served at an event to more than 200 City leaders and stakeholders. The event marked the first time a commercial brewery brewed beer with 100% advanced-treated recycled water. Mayor Kevin Faulconer presented a proclamation that declared March 16 "Pure Stone Day" to recognize the partnership. The partnership garnered more than 80 pieces of coverage from local, national and international media outlets.

Following the success of the Stone Brewing partnership, the Pure Water team sought to partner with a local coffee roaster. In 2018 and 2019, Ryan Bros Coffee brewed coffee with purified water produced at the City's Pure Water Demonstration Facility. The coffee was served to more than 100 riders and community members at a "pit stop" that was part of San Diego's annual Bike to Work Day. The partnership was covered on two local morning shows.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

As PUD moves closer to construction of the first Pure Water facilities and pipelines in 2019, residents living near the pipeline routes have repeatedly expressed concerns and fears about construction impacts in their communities. In an effort to stop construction in their communities, some community members have spread misinformation about construction impacts and the operational safety of the pipelines.

In response, PUD aimed to increase transparency and provide an opportunity for community members to speak to project team members about their concerns and have their questions answered. PUD, with support from the San Diego City Council, created four community-specific working groups based on areas of construction. The purpose of the working groups was to collect informed input and feedback from community members regarding opportunities to avoid or minimize potential construction impacts. Each working group was comprised of 8-13 members representing businesses, residents, schools/universities, community planning groups, town councils, and civic associations. Each working group has met four to five times since June 2018 for a total of 17 meetings. All meetings were open to the public.

In total, over 100 recommendations were made by the four groups. Of all of the recommendations provided by the working group members, 69 percent were adopted or will be used to inform the Construction Outreach Plan, 24 percent are under evaluation and 8 percent were not adopted based on a variety of reasons, including but not limited to, recommendations being outside of the scope of the project, inability to adjust the type or noise level of equipment that is required to complete construction, safety issues created if recommendations were adopted, requirements of the Municipal Code for noise permits, and the need to prioritize construction of the Phase 1 projects to ensure all are completed in time for commissioning. PUD will keep working group members engaged and informed throughout construction.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

In 2017, PUD launched an interactive GIS map on the City website to show locations of future Pure Water facilities and pipeline routes. Residents can visit the online map to see what projects will be built in or near their communities. After recommendations from community working groups, a search bar was added to allow residents to search for exact addresses on the map. PUD will continue to update the interactive map with construction information and updates.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

More information about Pure Water San Diego can be found at [www.purewatersd.org](http://www.purewatersd.org). The website includes program and project-specific fact sheet, FAQs, videos explaining the water purification process, and more.

An interactive Phase 1 project map can be found at [phase1.purewatersd.org](http://phase1.purewatersd.org), along with information on the community working groups and project-specific fact sheets.

Regular Pure Water Program updates are posted on social media:

Facebook: [www.facebook.com/purewatersd](http://www.facebook.com/purewatersd)

Twitter: [www.twitter.com/purewatersd](http://www.twitter.com/purewatersd)

Instagram: [www.instagram.com/purewatersd](http://www.instagram.com/purewatersd)

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Pure Water Demonstration Facility Tours	Educate San Diegans on the safety and reliability of water purification technology	Guided 1,020 tours to more than 17,200 people since 2011
Pure Water Speakers Bureau Program	Provide presentations to including civic, business, community, youth and industry groups.	Provided 647 presentations to more than 20,000 people since 2010
Community Events	Engage San Diegans at local events within their communities	Engaged more than 32,000 San Diegans at 260 community events to date
Community Working Groups	Gather input from community members on ways to minimize construction impacts of Phase 1 projects	4 community specific Working Groups convened with 39 members in total 100 recommendations received 69 percent of recommendations were adopted or will inform the construction outreach plan

Pure Water Day Open House	Host two Open House events with more than 300 attendees each	Hosted Open House events focused on Pure Water Demonstration Facility tours in 2016 and 2017 with more than 1,000 attendees
Partnerships with local businesses	Establish a partnership with a local business reliant on a sustainable water supply	Partnered with Stone Brewing in 2017 to brew Full Circle Pale Ale. Served the beer to more than 200 City leaders at “Pure Stone” event Partnered with Ryan Bros Coffee in 2018 to brew coffee with advanced-treated recycled water. The coffee was served as part of San Diego’s Bike to Work Day. Served coffee to more than 130 pit stop visitors.
E-newsletters	Distribute three email newsletters per year	Distributed 13 e-updates and 15 e-newsletters since 2014
Pure Water website visits	Provide informational materials and resources online for the public	More than 120,000 people have visited the Pure Water website to date to gain information about the Program
Pure Water social media followers	Increase the number of followers on Pure Water’s social media profiles	Pure Water’s Instagram followers increased 214 percent in 2018
Recognition from outside organizations	Receive awards and recognition for Pure Water’s outreach efforts	Received 18 awards for Pure Water’s outreach efforts to date

# City of St. Cloud Public Utilities, MN

## Beneficial Biosolids Reuse



### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: City of St. Cloud Public Utilities		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Wastewater (Nutrient, Energy, Water Recovery Facility): single plant, regional system. Drinking Water: single plant Stormwater		
Service Area (square miles): 91.1	Average Annual Daily Flow or Demand (MGD): WW: 10 MGD Water: 7 MDG	
Population Served: 118,000. Drinking Water, Stormwater: 66,000		
Location		
Street Address: 400 2 <sup>nd</sup> Street North		
City: St. Cloud	State: MN	Country: Stearns
Zip Code/Country Code: 56301		
Utility Representative Contact Information		
Name: Patrick Shea	Phone: 320-255-7225	Email: Patrick.shea@ci.stcloud.mn.us
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2017, 2018		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>22</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input checked="" type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>23</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input checked="" type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>24</sup> ( <input type="checkbox"/> IGP)		

## Application Part 2: Organizational Culture

### Application Part 3: Activity Area – Beneficial Biosolids Reuse

The St. Cloud region has a thriving agricultural work force that grows a variety of crops and the City of St. Cloud has been recycling biosolids for beneficial re-use on these lands for over 40 years. The Biosolids Management Program is a well-respected and established part of the local municipal and agricultural framework.

- Elements of the program are listed below:
- National Biosolids Partnership:
- Registered with National Biosolids Partnership (NBP) as an Environmental Management System (EMS) program in 2011.
- Certified at Platinum level EMS by NBP in 2014. Recertified in 2019.
- Resource Recovery Master Plan – Nutrient Recovery and Re-use Project:
- Initiated in 2013 to explore options for energy reduction facility wide and volume reduction of biosolids while continuing to produce a high-quality fertilizer product.
- Phases of the Master Planning included energy efficiency, energy reduction, biofuel utilization, biosolids Class A processing and nutrient recovery.
- Converting Fertilizer Product from Class B to Class A:
- Bench scale Pilot project for thermal hydrolysis in 2015.
- Installation of Lystek thermal hydrolysis process in 2018; production of a high solids, high organic matter, liquid Class A fertilizer product.

#### Nutrient Recovery:

As part of the recent Nutrient Recovery and Reuse Project, the City installed struvite harvesting equipment to recover phosphorus from the used water streams to improve the quality of effluent to the Mississippi River, reduce operation and maintenance costs related to struvite formation on pipe and

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<sup>23</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>24</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

pumps, provide phosphorus to areas that are deficient and created an additional revenue source to offset operation and maintenance costs.

### **Biosolids Recycling:**

Class A product allows for preservation of an established liquid biosolids program – continued use of facility owned and operated transportation and injection equipment.

The program selects from 8,700 state approved acres to provide local farmers with a highly valued agricultural product.

### **Sustainability in Action:**

58% reduction in gallons of product applied resulting in 8,000 less miles driven, and 2,600 gallons of fuel saved in a single recycling season when comparing Spring 2018 vs. Spring 2019 recycling season.

### **Maintaining Cost-Effective Services**

Required staff hours were reduced by 43% and eliminated the need for a contract hauling company.

### **Public Outreach:**

As part of the EMS program, a branding initiative was undertaken, creating a Biosolids logo, Mission Station and Goals.

Staff held a project open house at the facility to educate public on the new products being produced at the facility in 2019 that over 100 people attended.

### **Emergency Response:**

A Safety Data Sheet (SDS) was developed for the biosolids product, initially for Class B biosolids and more recently the Class A product. An SDS is carried in all application and transport vehicles and was distributed to regional emergency responders.

Program and product education for local emergency responders.

### **Pretreatment Program:**

The St Cloud Pretreatment Program became delegated in 1999, since then the concentrations of metals within the biosolids has dropped significantly.

Establishment of control documents with industrial users that have the potential to cause pass through, interference or upset at the Nutrient Energy and Water Recovery Facility.

### **Team Collaboration**

The Biosolids Management Program team consists of staff from all areas including; management, laboratory, operations and maintenance. All members of this team are involved in day-to-day operations and coordination with farmers, landowners and the State regulators. Statements from three team members are below:

“I believe the City of St. Cloud Biosolids Management Program is deserving of the Utility of the Future recognition because this program has transformed the way people look at what a Wastewater Facility can truly accomplish and how effective utilization of the nutrients can have a great impact for our community”. Rocio Durkot, Laboratory Technician.

“Workers are committed to doing a safe, efficient job and keep others concerns in mind”. Wayne Ethen, Heavy Equipment Operator.

“St. Cloud Biosolids Management Program is a leader in the field because of the constant improvements being made to make our biosolids safer for the environment and beneficial to the farmers. We are a very well run team that constantly looks for improving the efficiency of our

**Question & Answer:** How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

The development of the Biosolids Management Program into the Platinum Certified, nation leading, and innovating program that we have in 2019 has been a result of long term planning, visioning and dedication by the Public Utilities team. The development of a team wide approach, ensuring support from all aspects of staff from operations and maintenance through management and City Council, safeguards that program will succeed. Team members work with all local, state and federal stakeholders to ensure compliance with all required regulations and requirements as well as being on the leading edge of innovation.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

The Biosolids Management Program has an operating budget of \$740,000 which ensures enough operating and processing equipment as well as staff time and resources. Staff are cross trained from Drinking Water Services as well as Public Works to ensure staff are available as needed during recycling season. Staff are certified through the Minnesota Pollution Control Agency, Type IV licensing and attend multiple trainings throughout the year to ensure they are adequately experienced.

Did you partner with other stakeholders or organizations as a part of your implementation process?

The City of St. Cloud manages and facilitates their own biosolids management. Partnership opportunities for cross training within the City have been utilized for many years resulting in several promotions for staff that have previously cross trained during biosolids recycling season. The City of St. Cloud partnered with Lystek for the piloting and installation of the thermal hydrolysis equipment now in use at the facility.

The Program is currently working with Stearns County Soil and Water Conservation District on a the Forever Green initiative pilot project for planting kernza, a perennial wheat on biosolids approved acres, which upon harvesting could be used for beer production. Due to its deep root system, this perennial wheat has the ability to uptake excess nitrate and phosphorus, resulting in safe drinking water and clean receiving waters.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Biosolids recycling has a history of potential controversy and St. Cloud has worked diligently to ensure good relations with farmers, landowners and local interested parties. An accusation against the program in 2016 claimed that the recycling of biosolids resulted in contamination of groundwater. The Program worked quickly and efficiently to provide all information requested by the State (Minnesota Pollution Control Agency Emergency Response Team and Minnesota Department of Health) to ensure the Program had met and exceeded all requirements and regulations. The Program has continued to work alongside farmers and landowners, township board members and area homeowners to ensure their confidence in the protection measures in place and the safety of Biosolids recycling.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

The program uses two tractors and injection systems for application of product. The tractors are equipped with a GPS system and the injectors are equipped with flow meters. Prior to the GPS system, field size was determined by manually measuring a field and calculating the acreage. The GPS system has been utilized to verify and update acreage by driving the perimeter of the field and generating new maps. The

flowmeters on the injection equipment adjusts the application rate in proportion to the speed of the tractor. The use of these technologies together has facilitated more accurate application of product.

The Program has also used the City of St. Cloud website to improve communications with interested parties. Program documentation, along with invitations and news flashes, are posted in an effort to improve transparency and encourage public participation.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

The City of St. Cloud website has significant information about the Biosolids Management Program as well as upgrades at the Nutrient, Energy and Water Recovery Facility.

### Performance Measures & Results

The Biosolids Management Program looks at several performance measures when determining the success of the newly commissioned thermal hydrolysis equipment and the overall success of the program. The following table contains key performance metrics that are monitored on a regular basis.

The Class A thermal hydrolysis and nutrient recovery process equipment was commissioned in late 2018. All outcomes were calculated by comparing the Spring 2018 hauling of Class B product to the Spring 2019 hauling of Class A product. Although an entire 12 month period of the new equipment in place may result in different outcomes, the spring recycling season comparison has proven to be a success in meeting or exceeding several goals and objectives.

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Gallons of product stored/applied:	Sufficient space in current storage cells.	58.1% reduction in volume of product in Spring 2019 (Class A) vs. Spring 2018 (Class B). Able to convert two of six storage cells to holding tanks for other processes. Savings of \$12 million over 20 years by having the ability to reuse existing infrastructure.
Acres applied to:	Retain the amount of local approved acreage.	13.5% reduction in acres applied per season enabling greater flexibility on seasonable applications in Spring 2019 vs. Spring 2018.
Carbon emissions:	Reduce carbon emissions by reducing the number of trucks needed to haul product.	68.9% reduction in miles driven. 49.5% reduction in gallons of fuel used.
Phosphorus applied:	Reduce the amount of phosphorus being applied to reduce nutrient overload to the soil and facilitate runoff pollution prevention.	2.1% reduction in pounds of phosphorus applied across all sites.
Staff demand during recycling season:	Reduce the hauling days and number of hours needed by application team.	31.0% reduction in hauling days. 43.3% reduction in staff hours. Eliminated the need to hire contract hauling company.

Recycling program expenditures:	Reduce the cost to haul to facilitate long term success of the recycling program.	Contract services for transportation of product were reduced by \$50,000 per season.
Customer satisfaction:	Maintain excellent relationships with farmers and landowners by continuing to supply a highly valued agricultural product.	Farmers have been pleased with the additional potassium available in product as a result of thermal hydrolysis processing.

# City of Tallahassee Underground Utilities/Public Infrastructure, FL

## Partnering and Engagement



### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: City of Tallahassee Underground Utilities/ Public Infrastructure (UU/PI)		
Type Advanced Water Reclamation Facility (AWT) Thomas P. Smith Water Reclamation Facility 26.5 MGD capacity, 27 water wells 79.5 MGD capacity, water distribution system (1,200 miles), wastewater collection system (1,140 miles), 108 wastewater pumping stations, stormwater management system which includes 484 ponds, 390 miles of stormwater drains, and 26 miles of canals. In 2015, the Utility merged with public works to make the department the largest in the city at over 500 FTE' s This added additional responsibilities of street and sidewalk maintenance as well as maintenance of stormwater drainage ditches and canals.		
Service Area (square miles): 250 sq. miles	Average Annual Daily Flow or Demand (MGD): Wastewater 17 MGD Water 26.2 MGD	
Population Served: 275,000		
Location		
Street Address: 4505-B Springhill Road		
City: Tallahassee	State: Florida	Country: United States
Zip Code/Country Code: 32305		
Utility Representative Contact Information		
Name: Joseph Cheatham	Phone: 850-891-1009	Email: <a href="mailto:Joseph.Cheatham@talgov.com">Joseph.Cheatham@talgov.com</a>

If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below

Name: Joseph Cheatham	Title: Wastewater Ops. Mgr.	Contact Information :850-891-1009 Joseph.Cheatham@talgov.com
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## Application Part 2: Organization Culture

The City of Tallahassee Underground Utilities and Public Infrastructure was created in 2015 by combining its Water, Wastewater, Stormwater and Natural Gas Systems with its Public Works Department. The newly re-organized utility restructured its operations and customer service model and inherited functions related to streets, drainage, engineering and sidewalk infrastructure. Now known as the City of Tallahassee Underground Utilities and Public Infrastructure (UU/PI), the organization has over 500 employees responsible for five (5) division's, each working in partnership with the others to provide seamless services to its customers. The organization has leveraged this new challenge to improve service delivery, and through a more effective utilization of staff, technology, and training programs to provide high quality customer service in a more qualitative, expeditious and cost-effective manner.

The organization uses the Florida Sterling Council Business Model as its program for continuous improvement by focusing on: 1. Visionary Leadership, 2. Strategic Planning, 3. World Class Customer Service, 4. Knowledge Management, 5. Empowered and Engaged Work Force, 6. Process Management, and 7. Continuous Focus on Results. This business culture led to the Utility being named the first public utility in Florida to win the coveted Florida Governors Sterling Council Award in 2015. The award proves that the City of Tallahassee UU/PI is a role model organization in Florida that has excellent overall performance in all seven categories of the Sterling Business Model. This award is the state version of the national Baldrige Performance Excellence Award. In addition, in 2018 the City of Tallahassee UU/PI became the first public or private Utility to win the Florida Governor's Sterling Sustained Excellence Award. By becoming a sustained performance role model means we have exhibited a system and culture of performance excellence, including organizational sustainability, improved organization governance, continuous learning and risk taking, and strategic adaptability.

The organization has a mature leadership system, with multiple means for building relationships, engaging its workforce, customers and stakeholders in the community. Senior leaders actively demonstrate their commitment to the values and mission of the organization through the department values, vision and mission statement, customer credo and employee promise, participation at meetings at all levels and continuation of their own learning. Ethical and legal accountability are demonstrated through compliance reviews, a dedicated ethics officer, and anonymous hotlines.

Senior leaders communicate to its workforce through a department portal, all hands meetings, tail gate meetings, and through the city webpage.

Senior leaders are committed to the community and engage customers through their own participation in multiple outreach events, home owner association meetings, civic presentations, and City-wide special events such as neighborhood cleanup, and habitat for humanity projects. The utility also is the sponsor for the communities Holiday Parade and Springtime Tallahassee Celebration.

The organization values its workforce members and engages them in high performance work practices. Beginning with team-based interviews and to the highly recognized on-boarding process, the organization strives to hire the right person to fit the culture that has been established. New hires go through a two-day new hire orientation and meet all division senior leaders. They are introduced at senior leadership team meetings where they get a broad perspective of the entire organization. The strategic advantage of the City of Tallahassee UU/PI is attractive benefits and competitive compensation.

A knowledgeable workforce is important to the organization and employees have multiple educational and training programs including industry specific training, city HR & Safety training, Certified Public Manager through Florida State University, six sigma, yellow and green belt teams, leadership academy, attending WEF and FWEA conferences and participating in the departments career progression program. Participation in the career progression program is mandatory for new hires. Eighty Six percent of the organization has a career path to participate in. Sixty three percent of the department's employees have seen upward mobility. Employees are recognized for high performance with a variety of awards, pay increases as they progress, reclassifications, and potential for bonuses for high performance team participation or one-time tasks that positively impact the organization. In addition to career progression training, the organization promotes supervisory and leadership training to promote our future supervisors from within. Some divisions have a mentoring program in place for new hires and for those that request a mentor. Since 2014, the organization has used the Gallup Q12 survey to measure employee engagement. Overall results show favorable trends over the past 3 years.

The organization has an active wellness program that includes lunch and learn workshops, exercise classes including yoga and Zumba, wellness competitions, wellness incentives for preventative wellness care (personal leave awards) and wellness fairs. The program promotes diet, exercise and regular wellness checkups.

The organization participates in the Florida Benchmarking Consortium (FBC) in the water and wastewater service area utilizing 24 performance indicators with clearly defined definitions. The performance indicators are used to share data with over 35 other cities and counties in Florida to determine high performers. The organization consistently has been recognized in the top 5 performers in the FBC since it started participating in 2006. The best take-away from this process is learning and implementing "best practices" from other high performing utilities in Florida. The organization has also benchmarked with other organizations outside our industry such as University of Florida Shand's Hospital in employee engagement and Ritz Carlton hotels in customer service.

Safety is one of the highest priorities since water/wastewater industry is one of the most dangerous occupations in the US. The departments safety program includes safety manuals, safety training, safety committees, safety posters and job safety analysis is conducted on all major work practices. The organization conducts monthly safety briefings and utilize online computer safety training that can be utilized on night shift operations. Department has 2 full time safety/training officers. This summer there are plans to apply for the ISO 45001 Health and Safety Certification.

The organization has an intense focus on the protection of public health, safety, and the environment as it designs its products, services, and work processes to meet key industry standards and regulatory compliance. Environmental stewardship and leading-edge technology are two of the organizations core competencies, and as such, the organization strives to incorporate best practice strategies and innovative technology into the design and operations of the Utilities water resources. The organization is heavily regulated but strives for excellence in addition to compliance. The organization was one of the first utilities to be certified in ISO 14001:2004 in 2007 in the state of Florida and was one of the first in the nation to be certified in ISO 14001:2015. The Environmental management system (EMS) provides tools and an operating system that are being deployed across the entire department. While originally established in the Wastewater Treatment Division in support of the ISO 14001 certification, the organization recognized the benefits of the robust and well documented system and is deploying it uniformly across all divisions. EMS Implementation Teams, the EMS framework, as well as EMS tools are being leveraged across the department as a continuous improvement toolset when combined with PDCA. This helps to ensure continuous improvement, regulatory compliance and protect the community's environment.

The organization uses financial and operational data and information to manage its daily operations and to identify current performance trends and potential areas for improvement. Each month the Senior

leadership team reviews the financial Report card that provides critical information regarding the organizations fund balances, cash flows, and financial status of current capital projects segmented by each operational division. The constant surveillance of this data enables the organization to maintain its AA+ bond rating.

The organization manages its data through graphical displays on the portal which measures environmental impacts. The organization continuously monitors its operation through SCADA systems. Data is reviewed daily for its water resources utility systems which include water production and distribution, wastewater collections and treatment, reclaimed water systems, biosolids production and marketing, storm water management and overall energy conservation.

The Utility has won numerous other awards including the FSAWWA best tasting drinking water three times in the last ten years including back to back wins in 2016 and 2017, State champion FWEA Operations Challenge 2009, 2015 FWEA Phelps Award for AWT Category, 2013 FWEA Beneficial Biosolids Award, 2014 FWEA Reuse Award

### Performance Measure & Results

Your Performance Measure(s)	Your Results (quantitative or qualitative)	
Percent of staff enrolled in career progression	86%	Target 90%
Number of days to fill vacant positions	59 days	Target 60 days
Employee participation in wellness programs	32%	Target 50%
Days of Cash on hand (Reserves)	205 days	Target 150 days
Bond Rating	AA+	Target AA+
ISO 14001:2015 Compliance Audit-Findings	0 Major	Target 0) Major

### Nutrient and Materials Recovery

2009-2015 the City of Tallahassee Upgraded the 26.5 MGD Thomas P. Smith (TPS) Water Reclamation Facility to AWT Standards to reduce levels of total nitrogen (TN) and total phosphorus (TP). The award-winning plant was upgraded to protect one of the largest springsheds in the State of Florida, Wakulla Springs. Design included converting the facility to a 4 Stage Bardenpho process to promote nitrification/denitrification biologically. The design promotes luxury uptake of Bio P. The TPS facility uses two sources of carbon for denitrification (methanol and VFA from elutriation process in Primary Sludge Thickener.) The plant has experimented with the use of glycerol for an additional carbon source. Aluminum sulfate can be added to insure permit compliance for Total P. Cost of this project was 227 million dollars and was the largest construction project in the history of the City of Tallahassee.

TPS Facility removes TN from an influent of 35 mg/L to an effluent of TN of 1.00 mg/L. The facility removes TP from an influent of 5 mg/L to 1.2 mg/L. Both are well below the FDEP permit standards.

The city utilizes a 4,000-acre sprayfield for effluent disposal. The sprayfield is managed by a contract farmer who grows agricultural crops used for fodder for farm animals. The sprayfield has additional nutrient removal by the crops selected for maximum nutrient uptake.

In 2018 a design engineer was selected to conduct an alternatives evaluation for side stream treatment to further remove nitrogen and phosphorus from the anaerobic digester centrate. Project is underway with the outcome to be a pre-design report for the alternative selected. Side stream treatment of nitrogen and phosphorus is listed in the departments long term Strategic Business Plan.

Stormwater Pond projects to remove nutrients include the Lake Ella Park, Cascades Park, and the Upper Lake Lafayette Nutrient Reduction Facility using alum. The sediments can be captured and returned

through the City sewer system to the TPS facility. The Upper Lake Lafayette Facility treats stormwater with flows up to 200 cubic feet per second (2nd largest in the state of Florida), from a 10,000 acre highly urbanized watershed. Removal efficiencies have been demonstrated for 74% removal of total phosphorus, 68% for total nitrogen and 83% for fecal coliform. The facility is in operation 24 hours a day, with continual water quality monitoring and SCADA technology to maintain optimal treatment efficiency. To protect downstream flora and fauna, the system is designed with multiple levels of operational safety shut-off features. As mentioned above, construction of this facility resulted in a highly effective, innovative BMP that essentially provides a water quality retrofit for an entire drainage basin. Video.

The TAPP (Think About Personal Pollution) Campaign helps educate individuals on ways that small personal changes in home and yard practices can help keep local lakes, sinks and watersheds cleaner. The campaign is here to help citizens understand their impact on water quality and to encourage them to act by adopting some slightly different approaches to things you do every day. Program includes public information on why you do not need to fertilize your lawn, and if you do, use a low nitrogen content that has slow release into the soil. See the attached video that describes how the City's TAPP Program is helping to protect Wakulla Springs, one of the largest fresh water springs in the world. <https://www.youtube.com/watch?v=EnuQBVA1Iws>.

The city's Nutrient Reduction program is managed by ISO 140001:2015 EMS program since 2007.

In 2013, the Utility won the Florida Sterling Council's Team showcase competition with its "AWT Nitrogen Reduction" team presentation. This team demonstrated the continuous improvement culture at the utility by keeping 26.5 MGD capacity at the Thomas P. Smith WRF in full compliance with its plant operating permit during a major plant upgrade. The team demonstrated how the sterling criteria are used at the City of Tallahassee UU/PI to maintain our continuous plan do check act culture. The team also demonstrated the best use of data to achieve the project's superior results of maintaining a lower nitrogen value than the permit required during the 5 years of plant construction.

**How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?** The AWT Project was a team approach utilizing citizen focus groups, local and state environmental groups, Florida Department of Environmental Protection, Northwest Florida Water Management District, design engineer, construction manager, contractors and the treatment plant engineering and operations and maintenance staff.

**What type and amount of resources were needed to support implementation?** (e.g., financial, staff, other) . This was the largest construction project in the history of the City of Tallahassee at a total cost of 227 million dollars. The city used a combination of city funds and grants to finance the project. Most of the funding was secured through the sale of utility bonds with the funds paid back over 20 years through utility rates.

**Did you partner with other stakeholders or organizations as a part of your implementation process?** – see A above.

**What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?** The most difficult obstacle was the reduction of nitrogen through each phase of the construction schedule. This was called interim limits of TN removal permit requirements. This was met with operators and maintenance personnel setting goals while achieving those goals through teamwork from within the organization and with the start up engineers. Each milestone of the interim permit limits was met a year ahead of schedule for each milestone and under budget.

**Has "smart" information technology supported your implementation/optimization in this area?** If yes, please describe. The AWT project was fully automated with an Allen Bradley Factory Talk SCADA System. Each unit process is monitored and controlled from a central control room. Maximizing the

removal of nitrogen and phosphorus requires online sampling of water quality and a tight control on the use of electrical energy and chemicals

**Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?** [www.talgov.com](http://www.talgov.com)  
<https://www.youtube.com/watch?v=EnuQBVA1Iws>. <https://www.youtube.com/watch?v=ytB8XaG77DE>

<https://www.floridasterling.com/blog/city-talk-city-of-tallahassee-underground-utilities-the-path-to-the-governors-sterling-award/>

**Performance Measurements & Results**

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>	
Total Nitrogen Annual Average Effluent	1.00 mg/l	Target 3.0 mg/L
Total Phosphorus Annual Average Effluent	1.2 mg/l	Target 2.5 mg/L
Tons of Total Nitrogen Removed/yr.	866 tons/year	Target 828 tons/year
Tons of Total Phosphorus Removed/yr.	116 tons/year	Target 90 tons/year
Number of ISO 140001 Major Non-conformance	0	Target 0

**Application Part 3: Activity Area - Partnering and Engagement**

The City has committed to continuing aggressive capital project programs to upgrade its wastewater collection and to provide stormwater retention and treatment systems throughout its service area. These capital projects also contribute to the local economy by providing jobs (over 250 for the AWT project) and related impacts in other areas such as housing and retail services. Being the largest department in the City of Tallahassee we regularly provide job opportunities.

The City has established a relationship with local homeless transitional living facilities to recruit employees with win-win results.

The UU/PI Department actively partners with the City’s Environmental Policy and Energy services Department (EPER) in support of green initiatives such as reducing the carbon footprint through a reduction in vehicle idling and fuel conservation policy.

Annually the Utility actively supports the United Way and Christmas Connection charitable organizations. Employees participate directly in fund raising efforts and generously donate to these causes. The Department is recognized as a major contributor to these two charities.

The city provides tours of its TPS Water Reclamation Facility to local elementary, middle and high school students. The city also partners with the FSU/FAMU College of Engineering to provide guest speakers to their classrooms, plant tours and provides for a summer intern program for its students.

The city provides a summer youth program by partnering with the Leon County School Board for high school and college students to learn more about our organization and give them “real world” job experience.

Since 2008, the City has sponsored a Water Conservation poster contest in the local Leon County elementary schools to educate students on the critical importance of the conservation and protection of water resources. Over 1000 students participate each year, with the winners recognized by the mayor at City Commission Meetings.

As part of a city-wide beautification focus, each year the Utility participates with fellow citizens in low income areas to pick up trash and other debris in their neighborhoods.

The Gas Utility supports the home builder’s community by being a sponsor in the annual “Parade of New Homes”.

The utility sponsors a “Neighborhood Leadership Academy”. This 12-week Program takes place once per year and not only provides education, but also solicits information and feedback from more than 20 key leadership participants and homeowner associations throughout and around the City.

Senior leaders and the workforce volunteer their time in key communities that support youth, civic groups and charitable organizations. For example, the South City area has statistically higher infant mortality rates and has been identified as a priority for city-wide services. The Utility has joined those efforts to improve their quality of life by investing in new stormwater, water and sewer infrastructure projects.

The Utility sponsors the Christmas Holiday and Springtime Tallahassee parades that draws over 100,000 attendees each year.

The Utility utilizes social media and web-based approaches to communicate with our customers. Also, the utility uses email and text messages for instant alerts for notification of maintenance areas and utility outages.

The city has produced an i-phone app that allows the customer to use pictures, and videos to notify the City of issues of customer related concern through a program called Digitally.

The City uses Customer contact surveys to notify us of either outstanding customer service or show us areas for improvement

To reduce our carbon foot print, the City Gas department offers double rebates for customers to purchase gas appliances. This allows potential customers who normally could not afford to make the switch to natural gas the ability to make the change.

The Utility provides volunteers each year to build low income housing in the” Habitat for Humanity project”.

“Neighborhood Reach” program is an innovative community program designed to help Utility customers lower their energy bill in selected neighborhoods to receive a free home energy audit, free energy saving products, and energy efficiency tips to help their families save energy, water and money.

Held an “Earth Day Celebration: at the TPS Water Reclamation Facility that include plant tours, laboratory tours, tour of the City’s solar energy farm, educational booths, refreshments and activities for families with children.

TEMPO focuses on the community youth who are out of school and out of work. The target aged group is 16-24. The program/initiative seeks to identify, engage, and reconnect disconnected youth to education and employment opportunities. TEMPO offers an alternative to those who are most susceptible to crime as a victim, suspect of perpetrator.

**Performance Measurements and Results**

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>	
Number of Energy rebates/year	5378/year	Target 5,000 /year
Number of Home Energy Audits/year	1,251/year	Target 1,100/year
Stakeholder Outreach Index-measures how efficient our outreach programs are, how we use the data to improve our processes and how we review comments and develop actions from the feedback from our stakeholders. Scores for each outreach event	80%	Target 90%

are scored with a maximum score of 10 for each event. Results are in percent of maximum total scores	
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**Additional webpages for information:**

<https://www.floridasterling.com>

<http://www.talgov.com/you/you-water.aspx>

<http://wakullaspringsalliance.org/>

<http://www.flbenchmark.org/>

<https://www.iso.org/standard/60857.html>

<http://rrstormwater.com/city-tallahassee-stormwater-management-regulation-compliance>

<https://www.youtube.com/watch?v=wPmC1S5ImT4>

# City of Wichita Falls, TX

## Water Reuse

### Application Part 1: Background Information

Utility Name: City of Wichita Falls		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): <b>Multiple Plants, Potable &amp; Non-Potable Systems</b>		
Service Area (square miles): <b>72</b>	Average Annual Daily Flow or Demand (MGD): Water = 15.3 MGD Wastewater = 8.948 MGD	
Population Served: <b>104,000</b>		
<b>Location</b>		
Street Address: <b>P.O. Box 1431</b>		
City: <b>Wichita Falls</b>	State: <b>Texas</b>	Country: <b>United States</b>
Zip Code/Country Code: <b>76307</b>		
<b>Utility Representative Contact Information</b>		
Name: <b>Daniel K. Nix</b>	Phone: <b>940-691-1153</b>	Email: <b>Daniel.Nix@wichitafallstx.gov</b>

### Application Part 2: Organizational Culture

Wichita Falls Utilities, a set of Divisions with the Public Works Department spanning water and wastewater services, is responsible for managing 4 source water lakes, 2 water treatment facilities, water distribution facilities, a wastewater collections system and 2 wastewater treatment facilities. The City of Wichita Falls has a long history of protecting the public health through the delivery of a safe drinking water and the conveyance of waste from the public homes and businesses. Wichita Falls Utilities is responsible for protecting the environment by monitoring source water lakes, reducing sanitary sewer overflows and treating wastewater to a level that it can be either discharged to the environment or used as a source of drinking water.

The Wichita Falls Utilities administration went through a growth phase in 2008, with the appointment of a new Director of Public Works and the creation of a Utilities Operations Managers position. These two individuals have worked closely together to provide necessary leadership and revitalize the Utilities organization by making significant improvements in services, workforce enhancement, and financial responsibility of the Utility.

Regulatory Compliance is a critical component of our Organizational Culture. Utilities Administration and Supervision evaluated where the City was in compliance, and where there were areas that we were either not complying with or that were close to non-compliance. Attention was focused on the areas that were in non-compliance, and plans were developed to finance and staff the improvement of these areas. This has yielded successful results in numerous areas of previous non-compliance and allowed the City to provide a better quality of drinking water and greatly improved protection of the environment.

Wichita Falls Utility Administration continuously cultivates an Organizational Culture that is based on improved performance and customer service through the evaluation of previous work, analysis of where the primary workloads exist, and the establishment of goals to make significant and measured

improvements to the service that we provide the public. This Organizational Culture is not limited to a single water or wastewater related Division within Utilities, nor does it function within a vacuum, but rather crosses all boundaries of Utilities with all water and wastewater divisions performing as a cohesive organization. The establishment of these goals have already seen major reductions in the number of Sanitary Sewer Overflows, the number of Water Main Breaks and the elimination of Taste & Odor episodes that are experienced annually, as well as a lower number of customer service interruptions.

With the new drought of record (2011 – 2015) that the Wichita Falls area experienced, collaborative connections that had been created between the water and wastewater divisions over the previous 3 years, were put to the test. The Water and Wastewater Treatment facilities, that had previously operated independently from one another, were quickly pressed into a Direct Potable Reuse project. The Superintendents of these 2 Divisions worked together harmoniously to develop the criteria and work procedures that would be necessary to accomplish this DPR project. They also developed a training program for their employees so that the operators and mechanics from one treatment plant understood the requirements of the other treatment plant. The utilities staff across the water and wastewater divisions demonstrated that their forged relationships could overcome all of the previous boundaries and successfully work together on a groundbreaking project to overcome the natural disaster of drought.

For the last 11 years, the Wichita Falls Utilities has focused on improving community outreach. We have increased the number and level of communications that we conduct with the citizens of Wichita Falls. In residential areas that are experiencing water or wastewater issues, we are now providing literature to all of the citizens about what is going on, why the event is happening, how it might affect them and what they can do in the future to help prevent it from happening again. These community outreach programs have been very well received by the citizens. We also have expanded our reach into the local school district, by providing tours of facilities, showing the technology classes how we use technology within the water/wastewater industry and in those instances where the class cannot come to the plant, we have created virtual tours in PowerPoint so we can go to the classrooms and teach there. Our most recent initiative with the Wichita Falls Independent School District is the creation of a training opportunity at their Career Education Center, where we will be teaching high school students a Basic Water Operations course, which will allow them to test for the Grade D Water License. The objective of this program is to get career oriented students interested in the water/wastewater industry and provide them with the education and skills necessary to enter the field right out of high school.

Employee skills are a priority for the City of Wichita Falls, and the Utilities Divisions. We recognize that our services that we provide are only as good as the skills that our employees possess. Therefore, we have steadily increased the amount of money that is budgeted annually to provide training for the utilities staff, and assembled a large array of various training opportunities for them. Employee training records are now routinely evaluated and they are directed towards training that they have not had that would assist them in their daily functions. This program served the City well, when it decided to implement its 2 potable reuse projects, by having existing staff that was well trained and already in the mindset of learning new things.

The Utilities Divisions are committed to making the necessary improvements to its operations and staff for the betterment of the organization and enhancement of the services that are provided to the public. We are looking forward to a bright future and demonstrating excellence in all that we endeavor.

### **Application Part 3: Activity Area - Water Reuse**

The City of Wichita Falls owns and operates 2 wastewater treatment plants. The larger of the 2 plants, the River Road Wastewater Treatment Plant (RRWWTP) treats wastewater from the majority of the City, at a permitted flow rate of 19.91 MGD. The smaller plant, the Northside Wastewater Treatment Plant (NSWWTP) treats wastewater from a highly industrialized portion of the City, at a permitted rate of 1.5 MGD.

During the drought of 2011 – 2015, the City was faced with declining source water reservoir levels and a projection of being completely out of water by the summer of 2015. The City of Wichita Falls did not know when this new drought of record was going to end, but knew that it had a substantially treated, high quality wastewater effluent from both of its wastewater treatment plants, that was being discharged to a river and lost. Representatives from the City’s Public Works Department met with the State of Texas regulatory agency, the Texas Commission on Environmental Quality (TCEQ), and began the process of developing guidelines to implement a groundbreaking, temporary Direct Potable Reuse (DPR) project and a long-range, permanent Indirect Potable Reuse (IPR) project to utilize the high quality wastewater plant effluent as a drinking water source. Within a short 27 months, the City and TCEQ had developed the guidelines for the DPR plant, the testing protocols for monitoring and completely verified the operation of the full-scale facility to meet all of the requirements that would protect public health.

The Direct Potable Reuse facility began producing drinking water in July 2014, and operated for a full year, until July 2015. During that 12-month period, the DPR facility treated over 2 BG of wastewater effluent from the RRWWTP, turning it into drinking water. That 2 BG of water represented 50% of the drinking water supply that was necessary to see the City through the drought.

In 2015, the drought broke and the City continued to pursue its IPR project as a long term reuse strategy to supply drinking water to its citizens. By 2018, the City had made the necessary wastewater plant improvements for nutrient removal and laid a new 17-mile pipeline from the RRWWTP to the environmental buffer, Lake Arrowhead. The City began discharging the highly polished wastewater effluent to Lake Arrowhead, and within a short 8 months, had discharged over 2 BG of wastewater effluent to the lake. The 2 BG returned through the IPR project, represented 42% of the water withdrawn from the lakes during the same period, resulting in the overall lake withdrawals only being 58%. In a nod to its new function, the City of Wichita Falls changed its River Road Wastewater Treatment Plant name to the new Wichita Falls Resource Recovery Facility.

The City not only embarked on Potable Reuse projects during this period of water stress, but in an effort to utilize all of the wastewater effluent that was available, the City of Wichita Falls worked with a local industry to implement a non-potable reuse project for the water from the Northside Wastewater Treatment Plant. The local industry produces glass and was utilizing the potable water system for cooling water. The City, through a Global 210 Permit, received permission to implement the non-potable reuse project. A 1.5-mile pipeline was laid between the wastewater plant and the industry, and in February 2015, they began using all of the wastewater effluent from the small wastewater plant for cooling water, thereby offsetting the need for potable water. Since the drought ended in 2015, the industry has continued to utilize the wastewater effluent for cooling operations, totaling 143 MG (roughly 29% of their total water usage).

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

First, since there were no existing Federal, State or Local regulations on how to implement a Direct Potable Reuse facility, the City had to work closely with the TCEQ to develop those rules/regulations/guidelines/protocols. The City met regularly with the TCEQ to discuss the latest research on the subject and how it could be integrated into existing Clean Water Act and Safe Drinking Water Act regulations so that the public health continued to be protected with this new source water.

Second, the City of Wichita Falls had to gain the support of the very people that would be drinking this water, the citizens of Wichita Falls and the surrounding communities that purchased treated water from the City. We enlisted the assistance of local medical (M.D.s) and academic (Ph.D.s.) doctors to help us tell the public that the water would be completely safe to drink. We toured the doctors through the entire process, from the headwork’s of the wastewater plant through the entire drinking water process we were going to utilize. At the end, they were completely confident that the program would work and protect the

public health. So, a 20 minute, informative outreach video was put together, using the doctors to tell the story. This was distributed to the local media outlets and posted on YouTube, where it can still be viewed, today. The outreach program was so successful, that as the DPR verification process drew out, the citizens of Wichita Falls were complaining that the DPR was not up and running, providing them with drinking water.

Third, the entire process had to be tested. Due to the drought being the new drought of record and the rapidly declining lake levels, it was determined that there was not enough time to perform a 6-month pilot study. Therefore, both the City and TCEQ agreed to perform a “verification” of the full scale DPR facility, collecting data over a 45-day period. This 45-Day Full Scale Verification period produced 1,100,126 discrete pieces of data, covering 42 different locations throughout the treatment process.

During the Full Scale Verification period, we implemented and tested new Standard Operating Procedures and Communications Protocols between the Wastewater and Water Treatment Plants. Operators from the Wastewater Plant were taught about Water Treatment and vice versa. This allowed the operations between the plants to better understand the reasons behind why some of the treatment procedures had changed; for example, a requirement for the wastewater operators to leave some ammonia in the wastewater effluent to be used to combine with Chlorine for Chloramine disinfection and overall reduction in the regulated Disinfection By-Products, Trihalomethanes and Haloacetic Acids. Operations between the two facilities stayed in constant communications contact, hourly communicating the status of each other’s facilities and monitoring results.

What type and amount of resources were needed to support implementation? (e.g. financial, staff, other)

The Direct Potable Reuse project was financed through a \$13 million bond, and the Indirect Potable Reuse project was financed through a \$33 million loan from the Texas Water Development Board. Approximately \$300,000 of the TWDB loan was forgiven due to it being considered a “Green” project.

Did you partner with other stakeholders or organizations as a part of your implementation process?

The City partnered and coordinated with many stakeholders throughout the process of implementing the DPR and IPR projects.

One of the first stakeholders we coordinated with was the general public. They were the ones that would be directly impacted either at home or at their businesses, daily with the use of this potable water source. We were very transparent throughout the entire process of conceptualizing, planning, design, construction, testing and working with the TCEQ on rules. The media was crucial in conveying the information to the public. We kept the media well informed of the events and they in-turn kept the public informed and engaged in the projects. In the end, we had overall support from our citizens to advance these Potable Reuse projects. We were so successful with our public outreach, that in 2015, when the drought was over and we were wrapping up the operations of temporary DPR, there was an outcry from the public not to stop its operation.

The Medical community was the next most important stakeholder that we worked with from the very beginning of the implementation process. We conducted several meetings and workshops with the Wichita Falls/Wichita County Health Department, the local Board of Health and the Medical Coalition of Doctors. It was from these meetings that we were able to start bringing together a group of Medical and Academic doctors to produce a public outreach video.

We also engaged the Wholesale customers that purchase potable water from Wichita Falls. They were going to have to explain and sell the Potable Reuse to their customers, as well. We explained the potential of not having any water, as soon as the summer of 2015, and what steps we were taking to use the wastewater effluent and the processes that were going to be used to treat it.

And finally, we reached out to the local Board of Commerce and Industry to explain to their Board of Directors what we were trying to accomplish with the Potable Reuse projects. Afterwards, the Board worked with the City to establish 2 separate workshops where key/critical businesses and industries throughout Wichita Falls were educated on the Potable Reuse projects and were toured through the processes that were going to be utilized in treating the wastewater effluent to drinking water standards.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

There were numerous obstacles in implementing the Potable Reuse project. The most critical and the one that consumed the majority of the time was a lack of Rules/Regulations/Standards from either a Federal or State regulatory agency for Potable Reuse, especially Direct Potable.

The City engaged the State Regulatory agency for water and wastewater operations, the Texas Commission on Environmental Quality (TCEQ), to develop what would be necessary to ensure regulatory compliance and protection of the public health.

Both the City and the TCEQ evaluated the existing Clean Water Act and Safe Drinking Water Act rules to determine if they could be applicable in this case and if applied would continue to protect the public's health. It was decided that the CWA and SDWA would be excellent foundations from which to add the most recent and relevant science based research in potable reuse. These discussions yielded a comprehensive set of rules/regulations/guidelines for the City to follow while operating its Direct Potable Reuse project.

Additionally, since it was decided early on that there was not sufficient time to conduct a 6-month pilot test of the concept, the "verification" of the full scale facility had to be developed again from a lack of existing procedures or protocols. The City worked with the TCEQ to develop the testing locations and parameters to verify that all of the treatment processes being utilized were performing as the available research indicated.

The time it took from the first day the City approached the TCEQ about Potable Reuse to the time the DPR was operational and sending water out to the public, was a lightning 27 months. This is an unheard of speed to develop new rules/regulations, test a full scale facility and be granted approval by a regulatory agency. The City remains extremely appreciative of the resources that TCEQ committed to making the DPR and IPR happen and the relationships that were developed through the process.

Has "smart" information technology supported your implementation /optimization in this area? If yes, please describe.

Both the DPR and IPR were accomplished utilizing advanced technology; including, Supervisory Control and Data Acquisition systems, real-time online monitors, Water Modeling Software (IPR), Polymerase Chain Reaction instrumentation, Inductively Coupled Plasma/Mass Spectrometer, and other various laboratory instrumentation.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

The City of Wichita Falls has actively participated in the development of information to help guide others interested in Potable Reuse. The City's Utilities Operations Manager contributed to the development of an ANSI/AWWA Standard for Direct Potable Reuse (G-485) and is currently working with AWWA on an Indirect Potable Reuse standard.

The City has also participated in the development of the EPA's Potable Reuse Compendium, as well as multiple Water Environment Research Foundation research topics.

**Performance Measures & Results:**

<b>Measure</b>	<b>Targets</b>	<b>Outcomes</b>
<b>What are you measuring?</b>	<b>What was your goal/intended outcome?</b>	<b>What were your actual outcomes?</b>
DPR: Amount of provided for Potable Water.	DPR: Wastewater Effluent being 50% of the source water for Potable Water.	DPR: The wastewater effluent successfully supplied 50% of the water used for drinking water for 12 months.
DPR: Customer Complaints	DPR: To minimize the number of customer complaints through education and a high quality drinking water.	DPR: The City received zero customer complaints about the DPR water during the 12 months of operation.
DPR: Lake Levels	DPR: Stabilize the decline of the lake level and get out of the drought.	DPR: Lake Levels were maintained at a constant level for the 12 months that the DPR was operational, versus the previous 4 years of steady decline.
DPR: Primary and Secondary Drinking Water Standards	DPR: Total Compliance with all Primary and Secondary Drinking Water Standards	DPR: For 12 months, the DPR facilities operated non-stop, uninterrupted, producing a drinking water that complied with all Primary and Secondary Drinking Water Standards.
IPR: Phosphorus Reduction	IPR: Reduce the phosphorus in the wastewater effluent to <0.5 ppm.	IPR: The wastewater effluent discharged to the environmental buffer has been <0.2 ppm.
IPR: Discharge Volume to Environmental Buffer	IPR: Discharge 100% of the wastewater effluent to the environmental buffer, while the lake is > 6inches below the spillway.	IPR: Discharged 100% of the wastewater effluent to the lake, for 8 months, until the lake levels increased to the 6” below spillway level.
IPR: Lake Level	IPR: Reduce the amount of water taken from Lake Arrowhead and attempt to maintain volume.	IPR: Compared to the same time period from the previous year, the IPR was able to return 50% of the water taken from the lake, and raise the lake level by 1.5% while having a 6% reduction in rainfall.

# Clean Water Services, OR

## Watershed Stewardship



### Application Part 1: Background Information

Utility Name: Clean Water Services		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional water resources management utility		
Service Area (square miles): 122 square miles	Average Annual Daily Flow or Demand (MGD): 70.4 MGD	
Population Served: Over 600,000 residents and businesses		
<b>Location</b>		
Street Address: 2550 SW Hillsboro Hwy		
City: Hillsboro	State: Oregon	Country: United States of America
Zip Code/Country Code: 97123		
<b>Utility Representative Contact Information</b>		
Name: Mark Jockers	Phone: 503.681.4450	Email: jockersm@cleanwaterservices.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years. <input type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input checked="" type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>25</sup> <input checked="" type="checkbox"/> Activity Area 3: Energy Efficiency <input checked="" type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input checked="" type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>26</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input checked="" type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>27</sup> ( <input type="checkbox"/> IGP)		

## Application Part 2: Organizational Culture

Everything we do at Clean Water Services (CWS) aims to protect public health, while enhancing the natural environment of the Tualatin River Watershed. Combining science and nature, we work in partnership with others to safeguard the river’s health and vitality, ensure the economic success of our region, and protect public health for more than 600,000 residents and businesses in urban Washington County, Oregon. CWS has been recognized as a water resources Utility of the Future since 2016. It’s an honor we wear proudly, yet our organization continues to look to the future. CWS leaders actively encourage innovations and improvements to processes or practices that will engage the talents of our team and strengthen our relationships within our industry and with Mother Nature.

The foundation of our organization and culture is an approach Clean Water Services calls integrated planning. Integrated planning combines elements of transformational partnerships, agile operations, Lean Six Sigma principles, adaptive management and data-driven decision making to develop an environment where innovation, excellence and staff development thrive.

While CWS staff is organized into departments for cost accounting and budgeting purposes, we form multidisciplinary hubs to collaborate, create and problem-solve, connecting skills and resources to each task to deepen staff engagement and achieve optimal results. This integrated planning approach has saved more than \$300 million in ratepayer dollars over the past two decades.

Integrated planning requires a shift in the way employees think about and accomplish their work, and making that shift requires developing new skills. At CWS, employees are encouraged to consider their skills and the ways in which they can contribute to the mission and vision of the organization. The development of self and the resulting contributions to teams and the overall organization are referred to as “I to Us to All.” Clean Water Services invests in its people through a conscious and continuous journey from I to Us to All. We ask ourselves:

Where do I fit in? How does my daily work relate to our key strategic outcomes?

<sup>25</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>26</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>27</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

How do I define Us? When I envision my closest working relationships, do I see my department or program? A smaller workgroup? An interdisciplinary hub or a combination of different internal partnerships?

How does my work connect to the All – the whole CWS team beyond departments, divisions and budgetary hierarchy?

CWS has made a practice of investing in the “I” so that the “Us” and “All” reap the transformational rewards. Examples of CWS programs and opportunities related to organization development include:

The College of Clean Water, which was developed to bring our employees learning opportunities presented by educators and experts.

Our Passport program, which provides a peer-learning structure for employees to learn about all aspects of our work and consider previously unexplored collaborations.

Our annual goal sharing program, where employees develop challenging objectives, measures and targets and receive financial awards for successful completion.

Our collaboration with partners to find new ways to manage water resources during a time of significant industry-wide challenges, such as water supply and security, variable weather patterns, increasing regulatory requirements, urban growth and aging infrastructure.

The Tree for All program, one of the country’s largest and most successful landscape conservation programs. Tree for All partners have restored more than 140 river and tributary miles across 25,000 acres of Oregon’s Tualatin River Watershed.

Support for staff to exercise leadership in the community by serving on boards and advisory committees, playing key roles in professional associations, and completing training programs like Leadership Beaverton and Leadership Tigard.

Creating low-key, authentic opportunities (such as barbeques, paddle trips, watershed tours) for the prior General Manager and the new Chief Executive Officer to connect with as many employees as possible. Nurturing those connections with the workforce takes time and is a worthwhile investment.

Support for professional development, internal promotion and lateral transfers.

Annual and ongoing business process improvement practices.

The conversation about CWS’ culture is inextricably influenced by the organization’s mission, vision, values, promise and strategies. In 2017, CWS staff began a review of the existing strategic plan to determine accomplishments and construct goals for the next five to 10 years. The review reaffirmed our stated list of what we value:

Our employee team as Clean Water Service's greatest and trusted resource and asset.

A supportive, collaborative, team-based work environment utilizing timely communication and diverse backgrounds, skills and aspirations of all Clean Water Service's employees.

Active public awareness and involvement in Clean Water Service’s affairs and regional water resources issues.

Financially sound, fiscally responsible management maximizing value for Clean Water Services ratepayers and investors.

Quality, cost-effective customer service for Clean Water Services customers supported by friendly, service-oriented personnel.

Strong, visionary and principle-based leadership providing direction and purpose in the achievement of the mission.

Timely, efficient decision making at the appropriate level of the organization enabling Clean Water Services to act swiftly, responsibly and effectively.

Up-to-date, scientific and technical information available to everyone.

Technical excellence and innovation in the management of Clean Water Service's water resource facilities.

Protection of public health and enhancement of the environment through the development and delivery of programs and services.

A long-range, comprehensive basin-wide perspective on water resources issues, challenges and opportunities.

The strategic plan review has spawned the creation of an updated strategic approach that focuses on how we achieve five key strategic outcomes: organizational excellence, integrated water resource management and resilient watersheds, innovation and resource recovery, catalyzing transformational partnerships, and contributing to the region's economic and environmental vitality. These key strategic outcomes are defined as follows:

**Organizational Excellence:** CWS is a highly effective and transformative utility that maximizes the capabilities, talent and effectiveness of our employees to provide services and products that deliver on the values of the region we serve.

**Integrated Water Resource Management and Resilient Watersheds:** CWS optimizes and integrates the management of water resources for the benefit of the public and the environment by creating resilient watersheds in partnership with others.

**Innovation and Resource Recovery:** CWS provides services and products that deliver practical and pragmatic water solutions for our region to recover resources and to optimize our operations through innovation that is shared globally.

**Catalyzing Transformational Partnerships:** CWS goes beyond organizational boundaries to create and sustain strategic partnerships in the region to accomplish more than any one organization can alone.

**Contributing to Region's Economic and Environmental Vitality:** CWS' sound planning, investment and stewardship in regional assets is essential to Washington County's continued appeal as a place to invest, live, work and play.

Concurrent with the strategic plan update, Diane Taniguchi-Dennis, then the Deputy General Manager, assembled key staff from business services, government and public affairs, human resources and integrated planning into a hub called the Utility of the Future Organization Development Team. The hub drafted a scope of work and a purpose statement: "To support and advance our desired culture by refining existing employee engagement strategies and launching new ones as needed." It then launched a set of activities intended to draw data from every member of the organization, starting with a consultation with the leadership team about the culture in place and the culture they hoped to see. The team went on to conduct a similar exercise with our 65-person supervisory team. Data collection, including a series of employee focus groups, and analysis continue in 2019. The hub endeavors to identify the words, practices and behaviors that characterize the current employee culture, as well as the desired employee culture. The group then will propose actions that lead staff through that evolution.

Most organizations dare not paint outside the lines; progressive organizations redraw the lines. We are redrawing the lines. We would be pleased to again be recognized as a Utility of the Future. We appreciate your consideration.

### **Application Part 3: Activity Area - Watershed Stewardship**

#### **Overview**

Our practice of watershed stewardship dates back almost 50 years to the organization's founding and is rooted in community concern about the health of the Tualatin River and its tributaries. In the early years of the new millennium, Clean Water Services took this commitment to the next level. The Oregon Department of Environmental Quality issued CWS the nation's first integrated watershed-based NPDES permit under the Clean Water Act in 2004 just as we launched the Tree for All landscape-scale ecological enhancement program. At that time, CWS also put in place a Watershed Management Department and other necessary resources. The permit was most recently renewed in 2016.

The following is an overview of the practices, activities and programs in which CWS has engaged relative to Watershed Stewardship.

#### **Approaches**

**Transformational partnerships:** Throughout our watershed, we witness the power of partnerships that are transformational, not merely transactional. CWS has complex, long-standing relationships with more than 40 partner organizations, including county government; the 12 cities in our watershed; state agencies such as the Oregon Department of Fish and Wildlife; federal agencies, including U.S. Fish and Wildlife Service and the Bureau of Reclamation; community-based organizations such as Adelante Mujeres and The Wetlands Conservancy; coalitions such as The Intertwine Alliance and Tualatin River Watershed Council; and local, regional, national and international professional associations.

**Collective impact:** By sharing resources in bold and innovative ways, CWS and its partners realize greater returns on their investments. By leveraging alignment among our diverse organizational missions, we achieve important outcomes at a larger scale than would otherwise be possible.

**Unified vision statement:** "Enhance the environment and quality of life in the Tualatin River Watershed through visionary and collaborative management of water resources in partnership with others."

**A regional watershed approach:** "Beautiful clean water for today and tomorrow" is our promise to the community. We consider the watershed as an integrated system when evaluating solutions to regulatory requirements, and ask, "What would Mother Nature have us do to keep our promise?"

**One Water perspective:** We remind ourselves and the public that all water we drink has been consumed — and will be consumed again. We should judge water by its quality, not by its history.

**Strategic watershed assessment and planning:** We apply scientific knowledge and innovation to improve watershed health for community benefit through our Healthy Streams Plan and Water Quality Credit Trading Plan, as well as the Regional Conservation Strategy developed and implemented by a thriving network of partners.

**Green infrastructure:** CWS establishes standards for vegetated water quality facilities and riparian buffers; inspects facilities and trains others to do so; educates homeowners; and operates a natural treatment system that forms an ecological bridge between the river and gray infrastructure.

**Workforce capable of evaluating and maintaining effective green infrastructure:** Our workforce has long demonstrated green infrastructure expertise. We are building capacity in the private sector and among our NPDES permit co-implementers.

**Climate impact resilience principles incorporated into planning:** Ecological resilience in an era of climate change is articulated in our Landscape Conservation Strategy, which informs the work of our integrated planning teams.

**Holistic, integrated protection approach to surface water quality:** Our surface water quality work benefits from partnership, innovation, a multidisciplinary approach and public engagement.

**Integrated program to address wet weather issues:** CWS works across departments and jurisdictions to address issues such as the behavior of creeks separated from their floodplains, and the burden inflow and infiltration place on conveyance and treatment systems.

**Stream channel restoration:** CWS staff work in interdisciplinary teams to restore and protect stream channels using all available gray and green technologies.

**Riparian reforestation:** CWS is the lead partner in Tree for All, a landscape-scale restoration initiative.

**Critical land acquisitions:** CWS generally gains access to restoration sites through low- or no-cost permits of entry and easements.

**Flow restoration:** We collaborate with diverse partners to monitor flow in the main stem and selected tributaries; manage releases from Barney Reservoir and Hagg Lake; and are a lead partner in the Tualatin Basin Joint Project, which aims to address dam safety and water supply at Hagg Lake.

## **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Our general approach involves integrated planning, transformative partnerships, adaptive management, strategic investment and community engagement. Recent examples include:

Achieved milestones in landscape-scale restoration through the Tree for All partnership, including planting the 10 millionth plant, restoring the 141st river mile, and enhancing the 25 thousandth acre.

Activated Fernhill Natural Treatment System so the Forest Grove facility can discharge directly to the Tualatin River year-round and began evaluating designs for floating wetlands treatment.

Updated our Design and Construction Standards to address effects of hydromodification, an NPDES permit requirement.

Forged a complex partnership with U.S. Fish and Wildlife Service and other groups to develop a strategy to protect water quality and wildlife habitat at Wapato Lake.

With partners, acquired Balm Grove, the site of a small, obsolete dam identified as the most significant fish passage barrier in our watershed. Planning and permitting to remove the barrier are underway.

Helped tens of thousands of residents connect with One Water through a multifaceted education and outreach program.

Co-coordinated the ambitious Cedar Mill Creek Flood Remediation Collaborative, which developed a roadmap to address long-standing flooding concerns.

Offered consulting services at several sites in Oregon and China through the Clean Water Institute.

Developed a community college training program for landscapers who install and maintain green infrastructure.

In close partnership with the Bureau of Reclamation, took the next steps toward improved dam safety and increased water supply at Hagg Lake.

Partnered with U.S. Geological Survey to monitor and assess water quality in the Tualatin River, Fernhill Wetlands and Wapato Lake.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Watershed stewardship is the business of the entire organization and all our partnerships. In a sense, then, all of Clean Water Services' 355 employees and \$446 million budget are dedicated to watershed stewardship. Specific examples of resource investments include:

Our Watershed Management Department – home to the greatest amount of activity outside the traditional utility span of infrastructure operations and control – has a staff of 23 and an annual budget of just over \$6 million.

We have invested considerable staff time and some consulting resources in integrated planning processes and skill development.

Investments in public involvement, student education, communication and government relations have yielded important and lasting gains in watershed stewardship.

Did you partner with other stakeholders or organizations as a part of your implementation process?

Partnership is essential to CWS' watershed stewardship. Selected examples of implementation through partnership include:

Metro, the regional government, provides no-cost access to the natural areas it owns in the Tualatin River Watershed so CWS can conduct ecological enhancement along thousands of acres of riparian areas and wetlands.

CWS collaborates regularly with eight jurisdictions to co-implement our watershed-based NPDES permit.

CWS launched the Tualatin Watershed Enhancement Collaborative, heir to the earlier efforts of the Cedar Mill Creek Flood Remediation Collaborative.

CWS is part of a collaborative team that recently completed the design phase of the Wapato Lake pumping infrastructure project.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

System complexity may be the biggest challenge related to watershed stewardship. The Tualatin River Watershed is influenced by natural and industrial factors; urban and rural activities; green and gray infrastructure; and the actions of CWS staff, partner organizations, concerned community members and advocacy groups. It's complicated. A shift in one area brings changes – some anticipated, some not – in another.

The CWS approach to vast complexity is to see opportunities. When obstacles arise, our staff and Board of Directors get creative in their thinking and research, and especially in their partnership with those who might have common interests. The concept of collaborating for the greater good is not new, but it is often incredibly challenging.

Elements of integrated planning at CWS include innovation, collaboration with a broad range of stakeholders, agile response to opportunities and adaptation to feedback cycles. The culture at CWS also reserves space for not achieving success and for lessons learned. We celebrate the successes already achieved and recognize that complexity is a source of continuous opportunity.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Yes. CWS’ general approach is to embrace smart technology and to remove the silos separating information technology and operating technology. Specific examples of smart water strategies for watershed stewardship include:

Real-time control mechanisms that use weather predictions to store water when the creek is full, after a storm, and release it when capacity exists.

The flow portal on our intranet, which makes near-real-time data about tributary and main stem flow accessible to all staff.

Remote sensing and LiDAR via unmanned aerial systems (drones) to measure changes in tree canopy on a nearly real-time basis.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

CWS leadership and staff are always happy to field inquiries. Information about watershed stewardship also is available on our website ([cleanwaterservices.org](http://cleanwaterservices.org)), our social media channels (especially YouTube: [youtube.com/cleanwaterservices](http://youtube.com/cleanwaterservices)) and the websites for the Fernhill Natural Treatment System ([fernhillnts.org](http://fernhillnts.org)) and Tree for All ([jointreeforall.org](http://jointreeforall.org)).

**Performance Measures & Results**

Note: In many of these areas, our targets are qualitative, involving steady movement toward a healthier and healthier watershed, at a larger and larger scale.

<b>Measure What are you measuring?</b>	<b>Outcomes What were your actual outcomes?</b>
Number of community partners making financial investment	35+
Thermal load reduction from riparian shade	966 million Kcal/day in FY 2017-18
Created or enhanced wetlands and riparian habitat	141 stream miles to date Average of 10 river miles restored annually
Acres managed for watershed health	28,577 acres to date
Native plants planted by Tree for All partners	10,000,000+ to date (Target is 1,000,000/year)
Volunteers in community restoration events	~60,000 to date
Enhancement of flows through integrated flow management	8,000 acre-feet
Agricultural lands enrolled in water quality management program	~8,000 acres

Stormwater real-time control units	Four units installed to date. Aggregate results: 70% reduction in volume and duration of channel-forming discharges. 76% reduction in volume of erosive flows. 41% reduction in wet weather discharges compared to dry detention/passive basin.
Education and outreach	Engaged more than 19,000 students/year through participation in at least one presentation, lab or field experience offered or funded by CWS. Offered an average of more than 60 treatment facility tours a year. Distributed bimonthly paper newsletters to more than 50,000 customers, and monthly e-newsletters to more than 3,300 subscribers. Conducted face-to-face outreach at more than a dozen community events. Disseminated more than 100 stewardship-themed messages each year to more than 8,000 followers on social media.
Canopy cover	A 2018 shade monitoring study of 15 projects indicated that eight projects provided near to or greater than 80% streamside canopy cover, three provided near to or greater than 60%, and four provided less than 50%.
Sediment reduced	84.6 million pounds in 2018
Nitrogen reduced	23,600 pounds in 2018
Phosphorus reduced	23,200 pounds in 2018
Erosion control inspections	25,974 in FY 2017-18
Number of street miles swept	30,297 in FY 2017-18
Material removed during street sweeping	9,300 cubic yards in FY 2017-18
Number of vegetated stormwater treatment facilities inspected and maintained	1,661 in FY 2017-18
Number of responses to reports of illicit discharges	66 in FY 2017-18
Number of compliance inspections performed at industrial stormwater 1200-Z permit facilities	65 in FY 2017-18
Number of storm drains marked with “Dump No Waste, Drains to Stream”	243 in FY 2017-18
Number of catch basins retrofitted with water quality sumps to improve water quality	140 in FY 2017-18
Number of annual dry weather inspections of priority outfalls for illicit discharges	60 in FY 2017-18

**DC Water, Washington, DC**

**Partnering and Engagement**



## Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: DC Water		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Water distribution, sewer collection and wastewater treatment (regional wastewater treatment)		
Service Area (square miles): 725 sqm	Average Annual Daily Flow or Demand (MGD): Avg 94 MGD for water distribution. Built for avg flow of 384 mgd wastewater treatment, w/ 1 bgd peak treatment.	
Population Served: Drinking water: 680,000 residents, 700,000 employees and millions of visitors each year. Wastewater treatment: All of the above, plus wholesale customers in Loudoun and Fairfax counties in Virginia and Prince George's and Montgomery counties in Maryland, for a total of more than 2 million.		
Location		
Street Address: 1385 Canal Street, SE		
City: Washington	State: DC	Country: USA
Zip Code/Country Code: 20003		
Utility Representative Contact Information		
Name: Pamela Mooring	Phone: 202-538-2773	Email: Pamela.Mooring@dcwater.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
Current Program Members Only		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016, 2017, 2018		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.		
<input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>1</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input checked="" type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>2</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input checked="" type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>3</sup> ( <input type="checkbox"/> IGP)		

<sup>1</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>2</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>3</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

## Application Part 2: Organizational Culture

DC Water has a complex history of ownership and oversight, with infrastructure built by the Federal government, then operated by the District government, and existing since 1996 as an independent

instrument of District government. We serve the nation's capital with water distribution; wastewater collection and treatment; and resource recovery. We distribute drinking water to the District; we process wastewater regionally, including jurisdictions in Maryland and Virginia; and serve a population of more than 2 million.

DC Water recently changed leadership and revisited our strategic plan, creating The Blueprint, a plan that is more accessible for staff and more meaningful across the organization. The new mission, vision, and values were created by staff. Our core values, mission, and vision are driven by the needs of our ratepayer community, employees, and public health.

### **Culture of Safety-**

DC Water's mission and values statements reflect the organization's commitment to safety. Our Department of Occupational Safety and Health (DoOSH) strives to reduce or eliminate accidents and injuries through planning, inspection, and education. In addition to their role in investigations and inspections, this department conducts year-round training on a range of safety measures that directly impact our staff in the field.

### **Current services:**

- Facilitating safety training and education
- Reporting trends, tracking frequency, analyzing data
- Implementing outcomes to influence organizational policies and initiatives
- Analyzing hazards and implementing controls to reduce accidents, injuries, and health related incidents
- Maintaining environmental compliance programs
- Serving as DC Water's incident management team as safety officer(s)
- Investigating accidents, injuries, and incidents
- Identifying root causes to minimize risk and eliminate recurrence
- Safety Month/Safety Day
- DoOSH participates in the National Safety Council's Safety Month every June, with a day-long signature event, Safety Day. This day celebrates the teams, themes, and training that keep us safe at work.

### **Good Catch Program**

This program encourages employees to report unsafe conditions, providing recognition for the employee and broadcasting the "Good Catch" when the conditions are mitigated.

### **Safety Oscars**

Every year DoOSH challenges staff to create short videos on Safety. Winners are recognized at a Oscar-themed special screening.

### **Safety Trained Supervisor**

DoOSH ensures that supervisors in all areas are trained to prioritize safety and recognize hazards. 178 employees went through the 40-hour Safety Trained Supervisor (STS) course and received a 30-hour OSHA Construction or General Industry card. DC Water is listed as a Ruby Sponsor of the STS Program with the Board of Certified Safety Professionals. We currently have 27 certified STS and STS Construction

**Safety training-** DC Water offers training classes in diverse areas so that safety and health are prioritized in all work environments. Classes in defensive driving, first aid/CPR, bloodborne pathogens, confined

space entry, ergonomics, excavation, fall protection, and more are provided. We have conducted 56 safety training courses since 2018 for over 1,000 attendees.

## **Culture of Development and Recognition**

### **Summer Internship Program**

DC Water hires between 30 and 60 college interns, providing them with full-time, paid work experience in areas such as: research, operations, maintenance, legal, research, external affairs, accounting, etc. The interns are provided professional development and educational programs including resume development and water resources education. Each intern prepares a presentation on their summer experience. Some interns are hired for full-time work at DC Water.

### **Training and Development**

DC Water offers dozens of online trainings through Cornerstone Learning and provides on demand training when a need is identified. We contract with District of Columbia Human Resources to offer “Thriving in the Workplace,” providing basic skills for personnel. We provide Dale Carnegie training when a need is identified. First Aid, CPR, and AED are offered each month. DC Water offers tuition reimbursement for accredited college programs up to \$10,000 annually.

### **Employee Celebration**

Every year we host the Stars of Water, an annual black-tie gala recognizing the best contributions and performances of the year such as the X, Y, and Z awards. It also marks five-year intervals of service to the organization.

### **Workforce and Leadership Development**

*Leading Blue* is a multi-layered leadership development program initiated in FY 2019. The goal of this program is to create a common understanding and performance expectation within management across all departments. There are three ongoing activities, with a future, fourth activity:

High-potential leaderships: a year-long development program.

Line of sight training: every manager and supervisor attends a mandatory five-week training on supervisory skills.

Executive coaching: Directors get one year of Executive Coaching through contracted services.

Future coaching and feedback for performance, including leadership development for non-supervisory positions.

### **Culture of Wellness**

DC Water has a robust wellness plan for employees to maintain a healthy lifestyle. We provide employees with seminars throughout the year on requested topics and topics that we have seen as a growing trend when reviewing our healthcare data. Some topics include diabetes, tobacco; healthy eating; exercising on and off the job, obesity, etc. We conduct free flu shots and biometric screenings. We offer a de-stress fair in where we have vendors teach our employees how to de-stress in the workplace and at home. DC Water has programs such as our walking challenge using Fitbits that we provide to participants. We have cooking competitions to share healthy recipes. Lastly, we have an onsite gym and partner with Golds Gym to provide our employees with membership discounts. The Benefits Team regularly invites participation from the Union Presidents, ensuring that benefits and seminars are aligned with the staff needs and desires.

### **Culture of Strategy and Performance**

## Business Process Reengineering

DC Water is strengthening our capacity to manage and deliver change to improve business processes. Through a new strategic initiative, we are implementing a Business Process Reengineering (BPR) programs that utilize a DC Water specific BPR Toolkit that has been customized for DC Water needs from other successful Change Management and Change Acceleration processes. This initiative is designed to equip DC Water team members to fast track change efforts from idea through implementation, and results in efficiencies, transparency, and collaboration.

## Apprenticeship Program

Let's get this from Korey

## Culture of Fiscal Stewardship

A consistent revenue stream to cover O&M costs, debt service, and other liquidity requirements is vital for continuous water and wastewater service delivery. Our customer base is diverse and provides revenue from a variety of sources. Retail rates are charged for water, sewer and other services. Suburban jurisdictions provide wholesale revenue for their share of the Blue Plains Advanced Wastewater Treatment Plant O&M costs.

## Multi-Year Rate Proposals

We recently moved to a two-year rate proposal with benefits including: greater revenue certainty, increased budget discipline, and better alignment between revenues and expenditures.

## Clean Rivers Impervious Area Charge

A separate sewer service fee to recover the \$2.7 billion Clean Rivers Project (the District's CSO-LTCP) cost. This year, we are moving to a more equitable way to assess this charge, shifting to both an impervious area fee and volumetric sewer charges.

## Customer Affordability

In the District of Columbia, one-quarter of the residents are the poverty and affordability is of utmost concern in the planning process. DC Water seeks to balance its operating and financial needs with consideration to our customers' financial impact. We sponsor two programs to assist low income customers in paying their water bills and has partner with the District on financial assistance programs.

## Culture of Resiliency

### Cybersecurity

Our Cybersecurity program is based on Executive Order 13636 "Improving Critical Infrastructure Cybersecurity." We identify and prioritize opportunities for improvement within our business support systems by leveraging NIST 800-37 "Risk Management Framework"; Categorizing systems; selecting security controls (NIST 800-53, "Security and Privacy Controls for Federal Information systems and organizations"); and implementing and monitoring security controls. We've used the AWWA tool for security controls to prioritize security control implementation and partnered with both internal auditors to independently evaluate security controls and government agencies to provide situational awareness and Network Architecture Validation and Verification.

### Emergency Management

We have a Department of Emergency Management to support the Authority during times of crisis; prepare and train staff to act in a crisis; and develop policies and procedures. This department maintains equipment and communications with emergency management; city and regional agencies; and other

groups with similar missions: utilities, Silver Jackets (flood prevention), Homeland Security and Emergency Management Agency; and emergency response personnel. We have trained an Incident Management Team and use an Incident Command System to respond to emergencies.

### **Climate change and resiliency**

DC Water deliberately plans for natural and man-made disasters from storm flooding to sea rise to water emergencies. Structural efforts include construction of 500-year flood walls to protect vulnerable assets. We host an annual Critical Customer Roundtable to share best practices, identify weaknesses, and assist agencies and customers in identifying gaps in their planning. DC Water participates in numerous regional programs for long-range resiliency planning.

### **Application Part 3: Activity Area - Partnership and Engagement**

Possibly owing to its location in the nation's capital, DC Water has a rich tradition in leveraging partnerships and relationships to ensure that the organization continues to provide excellent services while also meeting the needs of the community.

#### **Public Outreach and Education**

DC Water participates in dozens of District special events, parades, street festivals and other celebrations, bringing hydration stations or even better—the new Quench Buggy that provides free water bottle refilling and water fountains, all on wheels. The teams also provide educational programs on water conservation, watershed protection and new engineering projects and how they will impact neighborhoods. DC Water also engages with the mass media for far-reaching news stories important to customers and introducing DC Water's innovations world-wide. From front-page stories in the Washington Post to international broadcast media, and local listservs and neighborhood papers, DC Water's media relations has touched millions.

DC Water services students within the District with classroom lessons, field trips to Blue Plains Advanced Wastewater Treatment Plant as well as hosting an annual Water Education Festival and participation in the Wonders of Water Event in conjunction with the Metropolitan Washington Council of Governments (MWCOCG) to provide educational opportunities and resources for teachers and students.

The outreach team conducted 77 community engagement events in 2018 alone, covering neighborhood and civic association groups, government and cultural awareness events and education, STEM and Back-to-School events.

#### **Research partnerships**

DC Water's Wastewater Treatment Department conducts world-renowned research, partnering with universities across the country and around the world.

#### **Green Infrastructure**

To achieve the necessary acreage of green infrastructure for enough stormwater capture, DC Water has partnered with agencies, groups, companies and individuals. From the downspout disconnection program to development of parks, these partnerships are creating value and beauty while solving a major environmental and public health issue.

Several examples of DC Water partnerships and engagements are presented in depth on the following pages.

#### **Stakeholder Alliance:**

Overview:

David Gadis, DC Water's newest CEO, brought great ideas to DC Water when he arrived last year. One of those was the Stakeholder Alliance—a panel of 20+ residents who provide informal input on a range of timely and important issues. In its first year, the group has tackled tough issues like the CRIAC, or

Clean Rivers Impervious Area Charge. Gadis developed a similar model in the past, and hopes this Alliance sends a clear signal that will resonate across the District and with the Council, the business community, NGOs, residents and other ratepayers.

### **Q&A**

A. How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

DC Water worked closely with the Council of the District of Columbia offices to identify Alliance members in each Ward as well as other civic leaders, large commercial ratepayers and businesses. Meetings are facilitated by Monte Monash of Monash Advisory Group.

B. What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Five to six staff members support the Alliance and meetings are facilitated by Monash Advisory Group.

C. Did you partner with other stakeholders or organizations as a part of your implementation process?

We recruited from every type of stakeholder-- environmental, churches, cemeteries, large ratepayers, commercial businesses. We have representatives from the Anacostia Watershed Society, the Anacostia Riverkeeper, the DC Hospital Association, AOBA, DC BID (Business Improvement District) Council, The group was selected with input from a variety of organizations and the interested parties, including the DC Council.

D. What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Time, from both perspectives. DC Water wants to be conscious of the time it is requesting from volunteers so as not to be overly burdensome, At the same time, Alliance members need enough information to do a deep dive into the subject to make meaningful contributions.

E. Any "smart" information technology. No.

F. For more information, please visit: [dcwater.com/whats-going-on/news/new-dc-water-stakeholder-alliance-created-provide-input-authority](http://dcwater.com/whats-going-on/news/new-dc-water-stakeholder-alliance-created-provide-input-authority) or contact Vince Morris at [Vince.Morris@dcwater.com](mailto:Vince.Morris@dcwater.com) or 202-787-2081.

### **Measure:**

- Recruit a full slate of representatives from across the District.
- Schedule and hold regular meetings.
- Productive listening and discussion sessions.

### **Targets:**

- Alliance members from each Ward, key civic, religious, business leaders.
- Quarterly meetings.
- Discussions lead to positive action.

### **Outcomes:**

- A full slate that is diverse geographically and demographically, was recruited.
- The SA is meeting quarterly.

To date, the Stakeholder Alliance was heavily involved in the recent budget planning period and provided input into the process. The Alliance propelled the District and DC Water to expand financial assistance programs for the CRIAC and to change the manner in which the CRIAC is assessed from impervious area only to a combination of impervious area and volumetric charge.

### **DC Water Works:**

#### **Overview:**

In recent years, DC Water embarked on a large-scale initiative to support the development and employment of local residents on DC Water construction and service projects. Called DC Water Works, the program serves as the first source for recruitment and referral of qualified candidates for new jobs – with a priority placed on District residents and those who live in our service area.

### **Q&A**

A. How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph? And B) B. What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

DC Water charged a dynamic team member with implementing the program. As it grew, so did his staff and budget. The team has significant resources in funding, staffing and District agency relationships. Further, creative use of resources, such as enlisting DC Water vehicles for CDL training classes, expands opportunities for relatively unskilled workers.

C. Did you partner with other stakeholders or organizations as a part of your implementation process?

To help identify local talent, DC Water works with over 20 strategic partners consisting of Government agencies and community-based organizations (the District Department of Employment Services; Court Supervision and Offender Agencies; Community Services of the AFL-CIO; Building Future Trades Program; Earth Conservation Corps; Job Corps; and the Department of Youth Rehabilitation Services), to serve as referral partners for contractor employment and training opportunities. The team uses feedback from program participants—both the employees and employers—for continual process and program improvement.

As part of the Water Works program, DC Water partnered with WEF and other organizations to develop the curriculum for the National Green Infrastructure Certification Program (NGICP). For ongoing delivery of the training, DC Water developed a partnership with the University of the District of Columbia (UDC).

D. What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Additionally, while the established goals target ready-to-fill positions, DC Water recognizes that education and training continue to be major inhibitors to employment for the community. Particularly for construction, the major population of individuals with the necessary skills to work on DC Water projects currently reside in the District of Columbia's suburbs. In response, DC Water Works also partnered with local organizations to expand the capacity of local residents to work with contractors on DC Water projects. Such efforts include a skills training and placement program.

The areas of training under this program may change from time to time, but shall generally be based on DC Water's construction forecast and the needs of project contractors. The Skills Training and Placement Program consists of three (3) stages:

- Stage 1: Soft Skills/ Job Readiness Preparation
- Stage 2: Skills Training

- Stage 3: Job Placement Services for Graduates

E. No “smart” information technology supported this particular program.

F. To find additional information please visit DC Water’s website: [dcwater.com/dc-water-works](http://dcwater.com/dc-water-works). For more information on the NGICP, please visit the WEF-hosted website: <https://ngicp.org/>

**Measure:**

- Percentage of vacancies filled by local hires
- Quantity and quality of partnerships
- Number of training programs

**Targets:**

- As part of the program framework, DC Water originally established the following goals:
- that 51% (now the goal is 60%) of new jobs created by contracts or procurements entered into by DC Water with contractors will be filled by local residents. New Jobs mean both union and non-union job openings, including vacancies created as a result of internal promotions, terminations or other separations, and expansions of the contractor’s workforce. In support of these goals, contractors use DC Water Works as the first source for recruitment, referral, and placement of new hires for all new jobs created for the Project, as they become available. Contractors give DC Water three (3) business days (Monday - Friday) to identify qualified candidates for job vacancies.
- GI Program- 51% placement goal
- High quality, collaborative partnerships, as many as needed to fulfill the program’s overall goals
- CDL and Facilities Programs– 80% graduation rate and 50% placement of the graduates

**Outcomes:**

- In 2018, 99 contractor positions were filled thru DC Water Works, of which 92% were local residents, including 67% of whom were specifically District residents.

In 2018:

**Commercial Driver’s License Training**

- 13 Participants
- 11 Completed the Program
- 10 Participants Employed

**Facilities Training Program**

- 7 Participants
- 6 Still in the Program

**Green Infrastructure Certification Program**

- 46 Enrolled
- 21 Graduated
- 18 Employed

**DC Clean Rivers Project:** Tunnel Forums and other partnerships that advance the DC Clean Rivers Project construction

## Overview:

As DC Water embarked on the largest construction project in the District since metro was first built, it was clear that the disruptions to residents and businesses would be enormous. Mining Metro-sized tunnels and digging dropshafts mere feet from some residents' front doors, was going to cause cracks and structural damage to buildings, loss of parking, traffic impacts, noise, vibration and displaced wildlife. The Tunnel Forum is essentially a neighborhood working group of stakeholders that represents local interests, including District elected officials, civic association leaders, along with residents from all geographic areas/construction sites.

## Q&A:

A. Implementing the partnerships and B. Resources needed.

By implementing the Tunnel Forum, DC Water creates a true collaboration between the community, DC Water, the project team, outreach staff, construction managers, and design build contractor. Tunnel Forums were assembled for the First Street Tunnel, now completed and the Northeast Boundary Tunnel, now underway. DC Water enlisted active community members, many of whom were skeptical of the projects, to join. These community members were active on social media, within local government and in their neighborhoods. They became advocates and in turn assisted in keeping the community abreast of important details associated with the work. The current collaborative partnership with the Northeast Boundary Tunnel (NEBT) outreach team and community fosters a positive environment for the duration of the project.

C. Did you partner with other stakeholders or organizations as a part of your implementation process?

Specific needs were apparent, including parking/transportation and support for local businesses in the construction area.

It was known that over 100 local businesses would be directly impacted along the busy Rhode Island Avenue corridor. In November 2018, DC Water entered into Memorandums of Agreement (MOAs) with three existing District Main Street organizations that cover all five construction sites on Rhode Island Avenue. The role of the Main Street organizations is to promote revitalization and retention of local small businesses. These agreements are the first of their kind for the agency and the District. The MOAs provide funding specifically to increase business at the impacted locations. No other major utility has demonstrated such an effort to mitigate impacts of an infrastructure project of such magnitude in the District.

During the First Street Tunnel Project, DCCR wanted to reduce the impact of parking loss to the surrounding community. To achieve some relief, partnerships were developed with various community stakeholders and property owners to allow parking on their sites for residents who lost their parking.

Additionally, crews working on the First Street Tunnel project parked in the alternative location to give back parking on the local streets. These partnerships grew and continued with the NEBT project. Partners such as Bethesda Baptist Church, Foreman Mills at the Rhode Island Shopping Center, and Mt. Bethel Baptist Church have allowed parking access for residents, patrons of neighborhood businesses, and crews working on the project.

DC Clean Rivers and SIH have entered a partnership with Uber to provide free and safe rides to residents who have lost parking in the immediate vicinity of their homes. Additionally, Uber will provide free rides to members of Mt. Bethel Church on Sundays. This partnership demonstrates our commitment to maintaining community support of the project and our understanding of the community needs and concerns around safety.

D. Most critical obstacle.

Overcoming the negative perceptions of DC Water and this project was probably the most difficult challenge. We had to change the way these neighborhoods thought about us and interacted with us. We changed the relationship from one of mistrust to one of trust. What began as two sides melded into one problem-solving Superteam.

E. No “smart” information technology supported this particular program.

F. For additional information please visit DC Water’s website: [dcwater.com/cleanrivers](http://dcwater.com/cleanrivers) or the project website [dcwater.com/NEBT](http://dcwater.com/NEBT). Email [dccleanrivers@dcwater.com](mailto:dccleanrivers@dcwater.com) or call the 24-hour project HOTLINE (800) 988-6151.

### 3. Measures, Targets and Outcomes

#### Measure:

- Solving parking problems/shortages caused by construction staging areas and associated work
- Support of affected businesses along NEBT alignment.

#### Targets:

- Provides free parking alternatives for residents, patrons of businesses. Providing this parking is key to the vitality of the commercial areas around the project.
- 2. Enough funding support (for increased marketing, promotions and other strategies to retain local small business) to retain about 100 businesses.

#### Outcomes:

- Safe parking alternatives provided through alternate sites and Uber, and positive feedback on the efforts.
- MOA formed with three Main Street organizations that serve the area of the NEBT alignment. Activities underway and quarterly reporting will measure outcomes and successes.

### Kennedy Center Partnership

#### Overview

In 2015, the Kennedy Center for the Performing Arts (KCPA) announced major changes to its expansion project (the REACH). The only available location on the property for the building was on top of a 9-foot diameter combined sewer overflow (CSO) pipe. DC Water, as part of its DC Clean Rivers Project, had future plans to build facilities to connect this sewer to its CSO tunnel system in the 2020s. A collaborative solution was achieved. The KCPA would allow the DC Water facilities to be constructed on its property, while DC Water would accelerate its project and allow the KCPA building to be constructed on top of the existing sewer.

#### Q&A:

a. How did you go about implementing the practices/activities/programs?

DC Water and the Kennedy Center for the Performing Arts (KCPA) moved rapidly to establish a memorandum of agreement. DC Water also fast-tracked the investigation and final design (less than 6 months) and worked collaboratively with the KCPA design team to ensure structural and architectural integration. Concurrent with the design, DC Water began the procurement process with the Kennedy Center's general contractor (GC), working collaboratively to solicit multiple competitive bids from subcontractors for each of the major elements of the work. Performing the design and procurement

process concurrently also allowed DC Water to integrate design-betterment strategies from the contractor. After reviewing the subcontractor bids for price competitiveness and performing two independent Owner's estimates, DC Water entered into a lump-sum agreement with the Kennedy Center's GC to perform the work. There were benefits to using the same GC, which included the efficiencies of having the same subcontractors for construction support services (environmental, hauling, instrumentation, etc.) supporting both projects on the same small site.

b. What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

The total construction cost of the CSO-021 project was \$30M. The design was developed by a team of approximately 10 staff members specializing in structural, geotechnical, and hydraulic engineering design. DC Water provided a full-time inspector and construction manager to oversee the construction of the CSO-021 project and coordinated directly with KCPA during the construction phase.

c. Did you partner with other stakeholders or organizations as a part of your implementation process?

A good partnership with the Kennedy Center was paramount to the project's success. Executive leadership at DC Water's DC Clean Rivers Project and the Kennedy Center had the willpower and ability to work out mutually beneficial solutions to potential issues very quickly - which required acceptance by the Board of Directors at both the Kennedy Center and DC Water. The District Department of Transportation (DDOT), District Department of Energy & Environment (DOEE), and National Park Service (NPS) were also critical partners.

d. What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Due to lack of space, a portion of the secant pile support-of-excavation system used for the CSO project was designed to also serve as the permanent foundation for the building. DC Water's engineers closely coordinated with the KCPA's high profile architecture team, ensuring visible features resulting from the CSO project were well integrated with the landscape design.

e. No "smart" information technology was involved in the partnerships.

f. For more information, please contact the DC Clean Rivers Project, Moussa Wone, at [Moussa.Wone@dcwater.com](mailto:Moussa.Wone@dcwater.com) or 202-787-4729.

## **Measures, Targets, Outcomes**

### **Measures:**

CSO 021 Project Budget and Schedule

Impacts to Kennedy Center due to construction of CSO 021 Diversion Facilities

### **Targets:**

Project Budget was \$34M. Original Substantial Completion date was May 17, 2018, and original Final Completion date was October 10, 2018.

Minimize impacts to Kennedy Center buildings, landscaping, and operations during construction of the

### **Outcomes:**

Project was completed for \$30M (\$4M under budget). Substantial completion date was achieved May 15, 2018. DC Water field punch list completion and demobilization from the site was accelerated and completed by June 8, 2018, allowing for earlier turnover of the site to the Kennedy Center for landscaping associated with the REACH project.

Upon completion of the REACH project, the area proposed for the CSO 021 Diversion Facilities will have been transformed into a landscaped outdoor gathering space. Construction of the DC Water facilities would have been also complicated significantly by the proximity to a new building constructed as part of the REACH project. By combining the two projects, technical challenges associated with proximity to the new building were overcome by building the facilities simultaneously. In addition, impacts to the completed REACH facilities will be limited to minor work from the surface using existing openings (manholes, removable slabs/hatches, etc.) to commission the CSO 021 Diversion Facilities in 2030, avoiding the need for significant excavation and long-term construction mobilization, which would have created substantial interruptions to Kennedy Center operations in the vicinity.

# Delta Diablo, CA

## Beneficial Biosolids Use



### Application Part 1: Background Information

Utility Name: Delta Diablo		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Single plant		
Service Area (square miles): 54	Average Annual Daily Flow or Demand (MGD): 12.6 MGD	
Population Served: 213,000		
Location		
Street Address: 2500 Pittsburg-Antioch Hwy		
City: <b>Antioch</b>	State: <b>CA</b>	Country: United States
Zip Code/Country Code: 94509		
Utility Representative Contact Information		
Name: Amanda Roa	Phone: (925) 756-1940	Email: amandar@deltadiablo.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2018		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>28</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>29</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>30</sup> ( __IGP)		

## Application Part 2: Organizational Culture

Not Applicable – Previously submitted in 2018 application package.

## Application Part 3: Activity Area - Beneficial Biosolids Use

Overview: Delta Diablo (District) has a long-standing history of sustainable biosolids management. The District stabilizes wastewater solids through anaerobic digestion (three digesters, 1.0 million gallons each), which produces Class B biosolids (13,000 wet tons annually at 25% cake dryness) and sufficient biogas to meet 60-65% of wastewater treatment plant (WWTP) power demand via an on-site co-generation system. The digesters are operated in the mesophilic temperature range 95-98°F with an average volatile solids reduction of 55%. The District has not exceeded any regulatory requirements associated with Class B biosolids production in its history of operations. Over the past eight years, the District has beneficially reused over 97% of its biosolids through land application and composting. To further improve biosolids management, the District has led and participated in various coalitions to find sustainable long-term solutions for the management of biosolids (former Bay Area Biosolids-to-Energy Coalition and current Bay Area Biosolids Coalition). The District has also implemented a fats, oils and grease (FOG) program to boost renewable energy production and is currently pursuing a food waste co-digestion project to further utilize existing solids processing infrastructure, improve digestion, increase renewable biogas production, and reduce greenhouse gas emissions.

**Key Practices, Activities, Programs:** A summary of key practices, activities, and programs that the District uses to manage this key resource recovery focus area is provided below.

**Regulatory Compliance:** The foundation of the District’s program is a focus on meeting all regulatory requirements associated with Class B biosolids production under 40 CFR, Part 503. Staff meets these requirements using standard operating procedures and process control setpoints, while ensuring all required biosolids sampling and testing is conducted. Digestion time and temperature operating

<sup>28</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>29</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>30</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

conditions are monitored in real time using the District’s Supervisory Control and Data Acquisition (SCADA) system.

Biosolids Quality Focus/Public Outreach Efforts: The District has implemented key programs to ensure a high-quality biosolids product, including pollution prevention and pretreatment activities to reduce concentrations of heavy metals and emerging contaminants in biosolids, and a regional “No Wipes in the Pipes” campaign to educate the public regarding the negative impacts of “flushable wipes.” During capital project planning and design, the District actively identifies and implements measures that protect biosolids quality. In particular, the District is currently completing design of a Headworks Improvements Project that will replace the existing 5/8-inch influent screens with 3/8-inch units, with the goal of removing more screenings and debris at the front end of the plant and reducing the potential for loss of active digestion capacity and negative impacts to biosolids quality. In addition, the District ensures receipt of FOG deliveries does not negatively impact digestion operation or biosolids quality through operation of a rock trap/grinder and intermittent sampling from delivery trucks at its FOG receiving station.

Regional Collaboration and Partnerships: In order to leverage available resources and benefit from potential economies of scale, the District is an active member of a regional Bay Area Biosolids Coalition that is working to maintain existing management practices, support technology evaluations, develop multiple new facilities in the region, and fund targeted research that underscores the value of biosolids products.

Industry Engagement: The District strongly supports staff engagement in local, state, and national industry associations and conferences to stay abreast of a broad range of emerging issues, opportunities, and technologies. These efforts include active participation in rulemaking processes at the state level that impact biosolids management practices (e.g., Senate Bill 1383 which requires diversion of organics from landfills with specific targets and dates).

Strategic Planning and Continuous Improvement: The District develops Strategic Business Plan Initiatives on an annual basis to support continuous organizational improvement efforts in the areas of Financial Sustainability, Leadership, Operational Excellence, Workplace Innovation, and Stakeholder Engagement. Opportunities for improvement in the biosolids management arena are considered each year with a current initiative to “Actively support the Bay Area Biosolids Coalition’s key strategic activities, including developing year-round biosolids management alternatives, forging partnerships to advance biosolids research, and informing key stakeholders.”

Policy Commitment: In March 2018, the District’s Board of Directors approved a Sustainability Policy that supports the beneficial use of the District’s biosolids.

Long-term Planning: The District is currently developing a Resource Recovery Facility Master Plan that will include biosolids management as a key focus area. The District will assess threats to current management practices, while evaluating the cost-effectiveness and sustainability of both established and innovative long-term biosolids management alternatives.

Land Use Planning: In 2017, the District acquired an additional 28 acres of property adjacent to the WWTP. A potential use of this site is development of a biosolids management facility with the scale and technology application to be determined in the future.

## **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

As referenced above, the foundation of the District’s biosolids management program is broad awareness and training to ensure that a Class B biosolids product is produced at all times to support a high degree of beneficial use via land application and composting. However, the key characteristics that support the

“Utility of the Future” concept are the District’s commitment to long-term sustainability, continuous improvement, and industry engagement/regional collaboration.

Long-term Sustainability: The District’s Sustainability Policy was adopted by the Board to support and reinforce sustainable business practices and promote continuous improvement in the environmental performance area. In addition, the District has established a Strategic Plan with a five-year horizon to support long-term organizational improvement. These guidance documents support organizational focus on long-term sustainability at the management team level with direct engagement with staff at all levels in the organization during development of annual Strategic Business Plan Initiatives. Continued participation in the Bay Area Biosolids Coalition and development of the upcoming master plan will assist the District in navigating the future path for its biosolids management program.

The District is currently pursuing implementation of the East County Bioenergy Project, which is an innovative \$38 million organic-waste-to-energy project via a public-private partnership with a local waste hauler that would produce sufficient biogas to meet 280% of plant power demand, reduce discharge of nutrients to receiving water, and provide a long-term revenue source to stabilize future rate increases to benefit our ratepayers. This co-digestion project would further enhance the performance of the digesters and increase biosolids production by over 50%, while effectively supporting the District’s long-term financial sustainability and innovation goals.

Continuous Improvement: This concept has been applied to drive organizational improvement and various operational enhancements to the solids handling process in recent years, including:

- Centrifuge upgrades to increase the solids content of the dewatered biosolids and reduce biosolids hauling costs and truck trips.
- Retrofitting centrifuges with recovery vanes to recover rotational energy from the discharged water, which reduced net energy use by 6% with a 3-year payback.
- FOG program implementation to enhance digestion, increase renewable biogas generation by 20%, generate tipping fee revenue, and reduce wastewater collection system O&M costs.
- Digester mixing system upgrade (mechanical to pumped) to improve digester performance.
- Screening improvements at headworks to reduce contamination and increase the quality of the biosolids.

Industry Engagement/Regional Collaboration: The District allocates staff and resources to support active engagement in a variety of forums at the local, state, and national level to identify and assess key issues that may impact current and future biosolids management practices. This engagement allows the District to consider strategic modifications to current practices, generate ideas for new activities, and evaluate the need for changes to existing program or development of new programs. Interactions with peer agency representatives at Bay Area Clean Water Agencies and California Association of Sanitation Agencies (CASA) helps to support a “learning culture” at the District and broader collaboration on new initiatives.

In particular, the District is strongly engaged as a member of the Bay Area Biosolids Coalition, which is focused on maintaining existing biosolids management practices (e.g., land application) and findings alternatives to the impending loss of landfill alternative daily cover in the next few years. The coalition is equally focused on leveraging available resources, funding at the state level, and emerging legislative and regulatory actions to support development of multiple biosolids management facilities in the Bay Area. The District is being included as a potential “host site” for a new facility with a variety of established and emerging technologies under consideration. In addition, the coalition is providing funding to support scientific research that advances and promotes the value of biosolids products relative to fertilizer alternatives and the benefits to restoring soil health, sequestering carbon, and reducing greenhouse gas emissions. Participation in this effort also supports the District’s continued collaboration with regulatory agencies and representatives.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Solids handling is the responsibility of the District's Resource Recovery Services Department, which includes O&M and lab staff. Although solids handling staffing costs are not tracked separately as it is integrated into the overall wastewater treatment plant O&M, an estimated 1.25 FTEs are associated with solids handling processes. The transportation and beneficial use of biosolids is handled through a third-party contractor (Synagro) and the District spends approximately \$500,000 per year in biosolids management costs (not including labor, chemicals, or power).

Did you partner with other stakeholders or organizations as part of your implementation process?

(Included in response to Question A above, repeated below).

The District is strongly engaged as a member of the Bay Area Biosolids Coalition, which is focused on maintaining existing biosolids management practices (e.g., land application) and finding alternatives to the impending loss of landfill alternative daily cover in the next few years. The coalition is equally focused on leveraging available resources, funding at the state level, and emerging legislative and regulatory actions to support development of multiple biosolids management facilities in the Bay Area. The District is being included as a potential "host site" for a new facility with a variety of established and emerging technologies under consideration. In addition, the coalition is providing funding to support scientific research that advances and promotes the value of biosolids products relative to fertilizer alternatives and the benefits to restoring soil health, sequestering carbon, and reducing greenhouse gas emissions. Participation in this collaboration also supports the District's continued collaboration with regulatory agencies and representatives.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

The most critical obstacle in the implementation of the District's biosolids management program is the regulatory uncertainty currently impacting development of future biosolids management facilities. At the state level, SB 1383 is currently in the rulemaking process and uncertainty regarding specific timelines, requirements, and enforcement actions has prevented direct investment by the private sector to build new facilities with capacity to meet future biosolids management needs. Although the District currently relies on land application, there is interest in supporting development of local, innovative technology installations that produce valuable biosolids end products. As described above, the District continues strong industry engagement and regional collaboration efforts to stay abreast of emerging regulations, technology, and science, while identifying opportunities for advocacy. The District has been supportive of CASA's efforts to work with CalRecycle during the SB 1383 rulemaking process to prevent local county ordinances that impose bans or practical bans on use of biosolids for land application, because diversion of organics from landfills to other uses (including co-digestion at WWTPs) will drive production of additional biosolids end products that will need to be managed in a sustainable and beneficial manner.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

The District is utilizing a SCADA system as "smart" information technology to support efficient and effective production of biosolids, while ensuring compliance with 40 CFR Part 503 requirements through real-time monitoring of digestion time and temperature conditions. The SCADA system and badges for truck drivers are also used to automate FOG deliveries in support of the District's FOG program.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

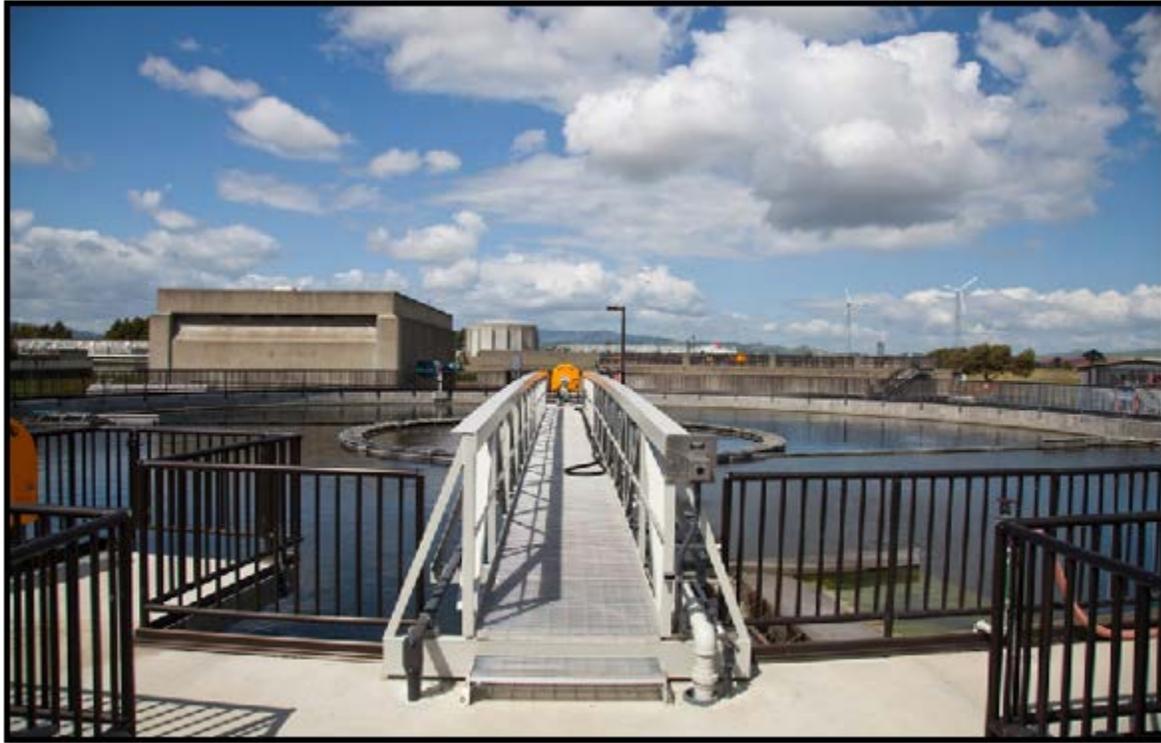
More information on the coalition efforts can be found at <http://www.bayareabiosolids.com/>

**Performance Measures & Results**

The District reported performance measures and results using the WEF/WRF/NACWA/WateReuse resource recovery baseline report as attached.

# Fairfield-Suisun Sewer District, CA

## Beneficial Biosolids Use



### Application Part 1: Background Information

Utility Name: Fairfield-Suisun Sewer District		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Single Plant		
Service Area (square miles): 42	Average Annual Daily Flow or Demand (MGD): 14MGD	
Population Served: 136,000		
<b>Location</b>		
Street Address: 1010 Chadbourne Road		
City: Fairfield	State: CA	Country: USA
Zip Code/Country Code: 94534		
<b>Utility Representative Contact Information</b>		
Name: Greg Baatrup	Phone: 707-429-8930	Email: gbaatrup@fssd.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input checked="" type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>31</sup> <input checked="" type="checkbox"/> Activity Area 3: Energy Efficiency <input checked="" type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input checked="" type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>32</sup> <input checked="" type="checkbox"/> Activity Area 6: Water Reuse <input checked="" type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>33</sup> ( <input type="checkbox"/> IGP)		

## Application Part 2: Organizational Culture

The Fairfield-Suisun Sewer District (District) is a wastewater special district serving approximately 136,000 customers in Central Solano County, California, about 40 miles northeast of San Francisco. The District safeguards public health and helps protect Suisun Marsh, the nation’s largest brackish water marsh and the largest remaining contiguous wetland on the Pacific Coast of North America.

### Organizational Culture

At the heart of the District’s progress is an organizational culture that continues to embrace positive change. Since originally being awarded the Utility of the Future designation in 2016, the District has taken several additional steps to foster a culture that enriches current employees, encourages continuous improvement, breaks down departmental silos, and promotes from within.

Most notably, upon the retirement of several long-term managers in 2017, each vacancy was filled in-house. In March 2018, the Maintenance Supervisor retired after eleven years with the District. The Maintenance Supervisor position was filled by a Grade V Treatment Plant Operator who moved up from his Operations Department position. Another Grade V Treatment Plant Operator was promoted to Operations Supervisor. The prior Operations Supervisor and Grade IV Treatment Plant Operator was promoted to Maintenance Manager following the retirement of the Maintenance Manager.

The District has seen its focus on promoting from within pay off. The District saves money and time not having to recruit high level managers from outside of the agency, and less experienced employees can see the potential for growth within the District, making them less likely to leave for another agency.

Beyond promotions, the District also allows employees to expand their skill sets and bring their talents to a different department. Yet another Grade V operator recently transferred from the Operations Department to the Engineering Department, where she now assists with pretreatment, planning, and construction management. Even with the movement of several Grade V and Grade IV Operators to other

<sup>31</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>32</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>33</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

departments, there are still five Grade V Operators in the Operations Department. The Operations Department is also in the process of kicking off a focused effort of in-depth process training for a number of new treatment plant operators.

The District has continued to break down silos within the organization. District electricians assist with inspection of major electrical capital improvement projects, allowing them to utilize their expertise to ensure the most reliable finished product. Furthermore, O&M staff are routinely included in planning and design development meetings so that operational considerations are taken into account and projects are well-coordinated. Engineering staff attend operational coordination meetings to provide updates on upcoming projects and to engage on assisting with corrective work that requires an engineered solution.

### **Other Activity Areas**

In addition to advancements in Organizational Culture, the District continues to advance in other Utility of the Future Activity Areas, including beneficial biosolids use as well as partnering & engagement.

### **Beneficial Biosolids Use**

In 2015, the District embarked on a unique public-private partnership with Lystek International, Inc., an organic materials recovery firm, to develop a new regional Organic Materials Recovery Center (OMRC) at the District's treatment plant site. The OMRC, the first facility of its kind in the United States, transforms biosolids (including 100% of District produced biosolids) into nutrient-rich, federally-registered liquid fertilizers and other multi-purpose products.

The new OMRC began receiving biosolids in August 2016 with a baseline volume of 14,000 tons per year. The facility continues to scale towards capacity by securing volume commitments from a growing list of California agencies, including San Francisco, Petaluma, Santa Rosa, Palo Alto, Benicia, and more. Lystek diverts hundreds of thousands of tons of biosolids from North American landfills each year in favor of higher and better uses, and the OMRC provides local San Francisco Bay Area agencies with a convenient, dependable, practical, and sustainable biosolids solution.

### **Partnering and Engagement**

To demonstrate the value that the District provides to the community and the environment, the District has created a series of video vignettes that are shared on the District's website and social media channels, as well as at plant tours and other outreach engagements. The videos were crafted by District staff and produced by an outside marketing company that creates impactful cinematic videos. The new videos include beautiful aerial footage, eye-catching graphics, timeless music, and a touch of humor to answer rate-payer questions in an engaging and memorable way.

2019 marks the District's third year of participation in the "Inspire: Dreams Start Now" and "Inspire: Dreams Move Forward" partnership with the Fairfield-Suisun School District and the Fairfield-Suisun Chamber of Commerce. The Inspire programs provide career exploration for local 8th graders, beginning with a hands-on career fair and culminating with a plant tour/job-shadow. The 2019 program inspired over 800 students.

Lastly, the District continues its active participation in the Bay Area Consortium for Water and Wastewater Education (BACWWE), which brings together industry and education partners to identify, train, and place qualified students in the industry. The District now has five staff members who are instructors or BACWWE Committee members.

### **Application Part 3: Activity Area – Beneficial Biosolids Use**

Overview: In 2015, the District embarked on a unique public-private partnership with Lystek International, Inc., an organic materials recovery firm, to develop a new regional Fairfield Organic Materials Recovery Center (OMRC) at the District's treatment plant site. Patterned after successful

operations in Canada, the OMRC is the first facility of its kind in the United States. The capacity is 150,000 wet tons per year.

The ORMC began operation in August 2016 and has processed all of the District’s annual 14,000 wet tons of Class B biosolids. The OMRC continues grow its number of customers and amount of material processed. Eight wastewater treatment facilities in the San Francisco Bay Area with approximately 48,000 wet tons per year of biosolids are being processed at the OMRC.

The OMRC transforms biosolids into multiple marketable products, including a Class A nutrient-rich liquid fertilizer called LysteGro, a recycled product to enhance digestion called LysteMize, and a carbon supply product for Biological Nutrient Removal called LysteCarb. Farmers in the area find the material highly desirable and over the first three years of operation, Lystek has experienced a greater demand than supply.

**Question and Answer:** The Activity described above was implemented as a public-private partnership with the support of the District’s governing board, open communication with regulatory agencies as well as public and private stakeholders, and strategic marketing to both dischargers who provide material and farmers who would utilize the finished product.

Implementation required staff resources for coordination. District staff worked closely with Lystek to craft an agreement that was mutually beneficial, to negotiate a fair rate structure, and to coordinate logistics for construction of Lystek’s facility. Capital costs were borne by Lystek, with the District supporting by sponsoring environmental documentation and providing under-utilized buildings and assets to Lystek as part of a lease agreement.

The most critical obstacle that the District had to overcome to be successful was the near-term cost increases for biosolids disposal. The District committed to increased biosolids disposal costs in exchange for a long-term cost-controlled solution that utilizes a technologically-advanced process to re-use biosolids in a sustainable manner. Costs are expected to be offset as lower-technology solutions (e.g., landfill disposal) are removed by state regulation and other viable solutions become more expensive.

The District has used information technology to support implementation of this partnership. SCADA automation, state-of-the-art instrumentation and controls, and quick and easy access to real-time shared data through a tool called e.RIS have all been critical to effective implementation.

For local press regarding the District’s partnership with Lystek, visit <https://www.fssd.com/news>

For a video on the partnership, visit <https://youtu.be/y83IDNOUWNk>

Additional information on Lystek’s process and other facilities can be found on Lystek’s website, <https://lystek.com>.

**Performance Measures and Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Biosolids Quality Improvement	Upgrade from Class B to Class A biosolids Product	Lystek is now producing a Class A fertilizer with the implementation of Lystek process
Improvement in long term financial viability of biosolids handling	Cost-certainty for biosolids handling	FSSD and Lystek have negotiated a 20-year agreement for cost-certainty

Impact on customer rates	Cost savings to FSSD ratepayers	FSSD’s net biosolids disposal cost is decreasing as third party biosolids deliveries increase—the average net cost is now only slightly higher than it was for landfill disposal.
Beneficial use of Biosolids	Move from use of biosolids as Alternative Daily Cover at landfill to higher level of beneficial use as marketable liquid fertilizer	50,700 wet tons of FSSD biosolids have been converted to fertilizer since 2016

# Flagstaff Water Services, AZ

## Water Reuse



### Application Part 1: Background Information

Utility Name: Flagstaff Water Services		
Type: Multi System Water Services: Water Production, Wastewater Treatment, Distribution and Collection, Reclaimed Distribution, Stormwater Management		
Service Area (square miles): 31 square miles	Average Annual Daily Flow or Demand (MGD): 7.1 MGD	
Population Served: 74,736 (City of Flagstaff population)		
<b>Location</b>		
Street Address: 2323 N. Walgreens St		
City: Flagstaff	State: AZ	Country: United States of America
Zip Code/Country Code: 86004		
<b>Utility Representative Contact Information</b>		
Name: Brad Hill	Phone: 928-213-2420	Email: bhill@flagstaffaz.gov
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today?

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship ( IGP)

## Application Part 2: Organizational Culture

The City of Flagstaff, Arizona is nestled on the edge of the Colorado Plateau at 7,000 ft. elevation. With a population of 75,000, it is the largest city north of metropolitan Phoenix and hosts Northern Arizona University. Surrounded by 1.8 million acres of Coconino National Forest, it is a city replete in the study of environmental sciences, housing branches of US Geological Survey, National Park Service, US Forest Service, Game & Fish, and US Naval Observatory, to name a few. Consequently, environmental issues are reflected in the Core Values and City Council Goals, which include:

- Taking meaningful climate change action
- Becoming a national leader in water conservation in all sectors
- To actively manage and protect all environmental and natural resources
- Attract and retain quality staff
- Enhance public transparency and accessibility
- Enhance relationships between the City and institutions of higher education
- Deliver quality community assets in public infrastructure

Flagstaff Water Services provides drinking water, wastewater, reclaimed water and stormwater management to our mountain community. The Division supports seven of the eleven goals set by City Council, aligned to community action objectives.

### Management

Quality begins with a supportive organizational culture and filters down to every position within the utility. Water Services is responsible for all elements of water within the City - Water Resources and Conservation, Engineering, SCADA/Information Systems, Regulatory Compliance, Water Production, Water Distribution, Wastewater Collection, Water Reclamation (two facilities), Reclaimed Water Distribution and Stormwater Management. We have twelve sections, including Administration.

Each Section has a manager on the Water Services Management Team, which meets monthly. This team is responsible for the overall mission and vision of the utility, tying each service segment into a cohesive water utility. Strategic planning takes place under this Team, as well as “transformational” levels of managerial training, working collaboratively and breaking down silos. Section Managers participate in the City-wide Extended Leadership Team, to better serve overall organizational goals, while encouraging peer-interaction and support.

Each Section meets regularly, to review goals, projects and performance measures identified for the current fiscal year. The entire Division meets semi-annually, to recognize achievements and share inter-division news.

### **A Tiered Approach to Job Scope**

Technicians for Water Services require a specialized skillset, compared to similar positions within the City. Working with Human Resources, a Multi-Skilled Worker broad-band classification was established in 2003 to acknowledge and compensate employees as they move through their certifications and seven skill-block levels. This structure motivates employees to perform to their best ability, and be compensated accordingly. A strong training budget is also provided, to facilitate these performance measures.

Supervisors also have a broad-band position, with three zones of growth, with pre-defined skills in management and technology, prior to advancing to the next level.

### **Communications**

In November 2017, Water Services added divisional responsibility of Communications to the Management Analyst position. By March 2018, a formal communications plan was created, with the mission to keep the public substantively informed on water-related events, projects, updates and surveys in our City; for the purpose of transparency in information sharing, relationship building and public services communications. The plan includes a major website “refresh”, with ongoing development, including outreach, blogs, and news posts as resources for the public. This includes all required reports and notices. An Education page was created, as well as the addition of a Request a Speaker or Tour page, to promote public outreach.

We created an interactive Capital Improvement Map, identifying the current year’s projects, with all of the pertinent data and locations. Some of our projects have a pictorial story map imbedded, allowing the user to follow the progress of the projects throughout its cycle.

We have a Facebook page to keep the public up to date on news, events and blogs. We joined the NextDoor app, to facilitate immediate announcements to focus neighborhoods potentially impacted by emergency repairs.

### **Training**

Training and peer interaction is a key component for success. Managers are expected to participate in industry-led conferences. More often than not, our staff delivers presentations at state and national conferences, holding committee positions with state chapters of AWWA, WEF, WaterReuse and our state Hydrology Society. Water Services staff often present at conferences sponsored by AZ Water, AWWA and WEF, and 2018 was no exception. Having an active voice within the industry keeps us abreast of new methods and research. As we share much the same problems, we are able to work together and learn from one another toward solutions.

**On the Job Training and Mentoring** Water Services employs training and mentoring practices throughout its daily operations. As an example, our Water Production Manager got his career-start as an operator. A large part of each Section Meeting involves problem-solving, engaging all employees. The nature of this industry lends itself to a Team-oriented work culture and jointly-managed solutions.

**Investing in You** City of Flagstaff offers Investing in You courses, to promote personal development and cultivate management skills for all interested employees. Succession planning, Managing difficult situations, Proper etiquette for public speaking and City Council meetings are some of the one-day workshops available.

**Mentoring** The city is currently developing a mentoring program through its Employee Advocacy Committee, Champions of Team Flagstaff. This pairs City leaders with employees seeking to build managerial skills. It is expected to roll-out this summer. The Champions Committee also hosts a Leadership Book Club, with discussions on leadership books, such as One Minute Manager, presented on 5/29/19.

**Internal Advancement** City policy promotes internal advancement. Job vacancies are often posted internally, before they are advertised to the public.

**Student Mentoring** Water Services trains local university students in practical skills related to the water industry. Each year, we offer temporary positions in Water Conservation, Communications and pipeline maintenance. Stormwater and Water Resource Technicians perform field work, hydrology studies and analyze data to support studies and projects. SCADA/ Information Systems technicians get hands-on experience in compiling data, and operating these critical systems. These are ongoing, temporary positions, dedicated to training our next generation of water specialists.

#### City Culture

**Wellness** The City hosts a TeamWell committee, promoting wellness in partnership with the Northern Arizona Public Employee Benefit Trust (NAPEBT). This non-profit manages benefits for five public agencies, including the County, Community College and K-12 School Districts, Housing Authority and the Public Transportation Authority. They sponsor a free wellness clinic, yoga and other exercise classes, finance and stress-reduction workshops, and have a limited free counseling plan available to employees.

**Employee Satisfaction** The City is in its fourth employee-satisfaction survey cycle; analyzing employee satisfaction, retention, succession planning and professional growth opportunities. This is conducted in two-year intervals, to allow the Champions Committee to respond to negative work conditions and implement changes. Since its inception in 2013, employee satisfaction in the workplace has significantly increased. People feel they are being heard, and responded to.

**Risk Management – Saving your Assets** There is a proactive risk management system within the City, and carried through each Section in Water Services. There is a city-wide program of all employees being their own and their colleague's risk managers.

**Safety Training** Safety training is conducted monthly. Supervisors assign Target Solutions or America Water College cloud-based trainings to complement on-site safety trainings. Weekly safety discussion are scheduled, capturing any current issues, trends or concerns. We have lone-worker safety devices for all employees at the water reclamation plants. This device will soon include gas detection features.

We also conduct annual trainings, based in OSHA-related subjects, such a confined-space training, lock out-tag out exercises as part of electrical safety procedures.

We recently had an incident in our water reclamation plant's Digester room, where rags caused pipe separation and partially-digested sludge spillage. SCADA alarms notified the responding operator, who employed best practices. Gas detectors alerted the operator to hazardous gases present, requiring self-contained breathing apparatus prior to entering the affected lower-levels of the facility. Hydrogen sulfide was present above safe levels, as well as methane gas, adding the possibility of an explosion to the event. Additional operators were called in to mitigate the leak and hazardous material, averting a possible disaster.

**Safety Manual** Operations is in the process of completing a comprehensive Safety Manual for all Water Service operations. It identifies training intervals and best practices, including OSHA standards and City policy.

### **Application Part 3: Activity Area - Water Reuse**

Flagstaff Water Services has become the Utility of the Future through its **Water Reuse** program, Activity Area 6. Located in a high desert region, Flagstaff has long been invested in practices that save every drop. Flagstaff produces all of its water; none is purchased. About 75% of our water is groundwater, reaching aquifers 2,700 ft. deep. This is augmented by 25% surface water production from Lake Mary, originally dammed along Walnut Creek watershed in 1905. **Recycled water** holds an important part in our water supply, **offsetting potable water use demand by 20% each year**. This motivates Water Services to actively pursue new and inventive solutions which include various forms of water reuse.

**Recycled Water Use.** Water Services has been irrigating with water since 1975. Recycled water is used in City landscaping, parks, schools and golf courses. Northern Arizona University (NAU) uses reclaimed water for landscaping and in the student-housing toilets. Recreationally, the City of Flagstaff provides Class A+ Reclaimed to the Arizona Snowbowl Resort; the first ski resort in the United States to use 100% recycled water for snowmaking. Recycled water tops off levels in a popular City fishing pond along the Rio de Flag drainage system. **About a third of all recycled water produced is reused** and distributed throughout the city, with the remaining discharged into the Rio de Flag to support riparian habitat and infiltration into our underlying aquifers.

**Reclaimed Production.** With two water reclamation plants serving the City, Flagstaff Water Services has made the commitment to convert 100% of its effluent into Grade A+ reclaimed water, regardless of its use. This commitment comes at a cost, as aging infrastructure is replaced with new and efficient technology. This year, we replaced the UV system at one plant at a cost of \$1.3 million dollars, and began work on a solids handling plan that will ultimately cost \$10 million dollars over three years.

**Compounds of Emerging Concern – Staying ahead of the curve.** In September 2012, the City Manager launched a five-year study to evaluate any potential threats to human health through the use of recycled water in our community. This independent advisory panel consisted of local, state and national industry researchers, scientist and professionals, and primarily focused on the potential impacts, if any, of antibiotic resistance bacteria within our reclaimed water. Through this effort, Flagstaff Water Services participated in several national funded research efforts with the University of Arizona and Virginia Tech. In January 2018, the panel concluded “there were no data to suggest that the continued use of reclaimed water provides undue risk to human health”. This was a huge step forward for the future of recycled water in Northern Arizona.

**Reclaimed Distribution Infrastructure.** To maximize a growing demand for recycled water, the Bushmaster Park pump station was completed in 2018, increasing flow rates from 800 to 2400 GPM, providing a 50% increase in recycled water supply. In 2020, we will replace a bottleneck in the pipeline, increasing capacity by another 100%. The five-year plan budgets a second, 2-million gallon storage tank by 2023.

### **Recharging the Aquifer – An Environmental Boost.**

The region does not typically have perennial streams; we do have major drainages that allow water to percolate back into the aquifer. Around 3,000-5,000 AF of Class A+ quality reclaimed water is released annually into the Rio de Flag drainage. Water Services maintains an agreement with the state Game & Fish Department to discharge a minimum of 200 GPM into the Rio de Flag, creating a stable, year-round riparian habitat for native species.

**Proactive Communication Improves Public Perception.** Flagstaff Water Services established a Communications and Outreach Program in March 2018, with an active website, news articles, forums, social media presence and e-blogs. A Recycled Water Survey posted on the City’s Community Forum in fall 2018 provided detail options for Advanced Treatment, and an opportunity for the community to weigh in on their views of Advanced Treated water.

**Advanced Water Reclamation Feasibility Study.** Flagstaff Water Services contracted with Brown & Caldwell Engineering in June 2018 to evaluate the best-fit option for advanced treatment at our two water reclamation facilities. This feasibility study provides a path forward for the City should the citizens of Flagstaff decide to pay for and implement advanced treatment within our community to treat recycled water to drinking water quality. The door to the future of Advanced-Treated water was opened in January 2018, when the Arizona Department of Environmental Quality changed rules that could allow for Direct Potable Reuse in Arizona.

**Water Conservation Strategic Plan.** Our Water Conservation Team is finishing their strategic plan, after extensive public input, to guide conservation efforts in the future. The Team performs water efficiency check-ups in households and businesses, offers a low-water landscape rebate program, water-efficient toilet rebates, and free rain-barrels recycled from local business.

**Water Reuse Arizona Program of the Year Award in 2018.** The Flagstaff Water Services Division was recognized as the water reuse program of the year by the state chapter of Water Reuse in 2018. This recognition stemmed from all of the advancements the City has achieved over the past several years in the water reuse arena.

### **Q&A:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

The Flagstaff community realizes the value of all water, with a long history of using recycled water as a long-term conservation strategy dating back to the 1970s.

We are currently moving to adopt a **One Water Plan** integrating this concept into the Water Resources Master Plan. This planning effort assesses a value to recycled water on a level with its potable counterpart. The first step is developing a steering committee, to identify guiding elements of the plan.

Most programs and projects begin with our **Capital Improvement Plan**, providing a 10-year view into the future. The reclaimed distribution system is aligned to projected future demand.

We rely on condition assessments of facilities and assets, prioritizing improvements and upgrades that are efficient and innovative, such as the *Rio UV disinfection project* completed this year.

We commission studies to identify reuse opportunities, such as the **2018 Advanced Treatment Feasibility Study**.

We work closely with consultants and other water agencies in the state on **branding and outreach** strategies, to raise awareness and foster transparency with the public. The goal is to associate our brand “We are Water” with a positive, public perception of trust and competency in their water utility.

Recycled water is used to enhance the **quality of life in the community**.

Recycled Water supports **snowmaking** at our local ski resort. This recycled water agreement provides for a consistent snow base, which in turn provides an economic boost to businesses, during a low-water demand season.

A natural basin along the Rio de Flag drainage became a City Park Pond, with the help of recycled water release. **Francis Short Pond** hosts hundreds of outdoor-ecology-based programs for Flagstaff’s schools annually, through a partnership with Willow Bend Environmental Education Center.

What type and amount of resources were needed to support implementation?

Flagstaff Water Services is fortunate to have community and local government support for water needs. Periodic rate studies are performed, with subsequent rate increases adopted. City Council has supported

rate adjustments over the past 10-years, voting to increase water, reclaimed water and wastewater rates. These rate increases allow Flagstaff Water Services to replace aging infrastructure and increase efficiencies to align to the City's recently adopted Climate Action and Adaptation Plan.

**Communication** plays a big role where reclaimed and Direct Potable Reuse (DPR) water are concerned. Bringing the subject to the forefront and educating the public on what recycled water is and isn't, results in increased community support. Our next Water Aware campaign focused on raising awareness of "what goes down the drain" and how it impacts the community.

Did you partner with other stakeholders or organizations as a part of your implementation process?

Water Services **connects with industry organizations** on a regular basis. We take an active part in the state WaterReuse Arizona chapter as well as the Arizona **Hydrological** Society and Friends of the Rio activist group. We regularly use water science interns to aid with studies and data collection. The City is in a leadership role in the regional watershed partnership group known as the **Coconino Plateau Water Advisory Council**. This group provides a forum for its regional members to discuss water related issues that are important to northern Arizona communities, Native American Tribes and state and federal agencies.

We hope to be successful in a joint grant application with **USBR, to test Advanced Treatment** for direct potable re-use, partnering with an engineering firm, the equipment manufacturer, University of Arizona and another Arizona city. Direct Potable Reuse is a huge investment. This project has the potential to test practical applications before we commit to the potential \$100 million-plus investment required.

We are **partnering with NAU and U.S. Geological Survey to conduct Aquifer Recharge infiltration studies** this year, identifying ideal locations to discharge recycled water to infiltrate into the underlying aquifer augmenting our groundwater supplies.

Local stakeholders played a huge role in the five-year study on **Compounds of Emerging Concern (CEC)**, employing a panel of local, regional and national scientists from U.S. Geological Survey, NAU, University of Arizona, Flagstaff Medical Center, Virginia Tech and the Translational Genomics Research Institute. This Panel evaluated the effects of CEC in the community, focused on Antibiotic Resistance Bacteria in recycled water. Their final conclusion, finding no undue risk to human health to Flagstaff citizens, opened the door to Advanced Treatment options within our community.

Water Conservation is active in the community. Flagstaff won the Wyland Foundation's National Mayor's Water Conservation Challenge in 2017 and was 2nd nationally in the 2019 campaign. The Strategic Planning process involved local stakeholders, including landscaping businesses, local university and conservation organizations.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

The most critical obstacle to success in Water Reuse is funding and community support. Our reclaimed water system did not financially support itself initially but was subsidized by water customers. With City Council backing, the recycled water program now has rates in place to be fully self-funded, as we expand the program in our community.

Has "smart" information technology supported your implementation/ optimization in this area?

Our reclaimed system is managed using the same industrial computer **SCADA controls** that oversee the entire water process; from production to reclaimed distribution or release to the environment. This actively-managed system monitors water chemistry, volume, flows; detecting demand throughout the City and supplying it automatically. Should chemistry levels become unsafe, alarms are sent to the on-call operator.

**Our GIS staff** use technology to map every mile of pipe in the system, identifying leaks and repairs in real time using a collector-app. This year, the Bushmaster Pump station was fitted with SCADA technology to move reclaimed water as demand increases.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

To learn about our programs, activities, and practices, visit the City of Flagstaff Water Services website at: <https://www.flagstaff.az.gov/1275/Water-Services>

For information specific to Activity Area 6, Water Reuse, visit <https://www.flagstaff.az.gov/21/Water-Recycling> OR

Check out our education page, for information regarding Advance Treatment: at <https://www.flagstaff.az.gov/4046/Advanced-Treatment-FAQ>

Results of our Recycled Water Survey are posted here: <https://www.flagstaff.az.gov/DocumentCenter/View/60960/Recycled-Water-Survey-Results>

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Advanced Treatment Feasibility – USBR grant	The goal is to test DPR in our community before making the \$100 million dollar plus investment	USBR grant award has not yet been announced
Aquifer Recharge Study	The goal is to recharge 100% of excess reclaimed water into underlying regional C-aquifer	This project is slated for completion in 2020
Reclaimed Water modeling analysis	This analysis is part of proposed One Water Plan in the Water Resources Master Plan	This project is slated for completion in 2020.

# Fort Wayne City Utilities, IN

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: Fort Wayne City Utilities		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Multiple plants (one water filtration plant for drinking water and one wastewater treatment plant), stormwater		
Service Area (square miles): 180.35 square miles – wastewater 150.87 square miles – water 92.00 square miles – stormwater	Average Annual Daily Flow or Demand (MGD): 49.98 MGD – wastewater 32.00 MGD – water	
Population Served: 292,000 Retail and Wholesale – wastewater 309,000 Retail and Wholesale – water 262,450 - stormwater		
<b>Location</b>		
Street Address: 200 E. Berry St., Suite 270		
City: Fort Wayne	State: IN	Country: USA
Zip Code/Country Code: 46802		
<b>Utility Representative Contact Information</b>		
Name: Ashley Faurote	Phone: 260-427-8587	Email: ashley.faurote@cityoffortwayne.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b>		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2018		

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>34</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>35</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>36</sup> ( IGP)

## **Application Part 2: Organizational Culture**

Fort Wayne City Utilities (City Utilities) is committed to on-going interaction with our customers to help ensure that our products, service levels, operations, and financial plans reflect a balance between the desires of customers, our obligation to fulfill regulatory requirements, and the responsibility for stewardship of public infrastructure and the environment. City Utilities believes in building stakeholder understanding through involvement and education since informed stakeholders appear to be more satisfied and more supportive, we do this through a variety of methods and partnerships:

Utility Advisory Group (UAG) –The UAG is a sounding board for the utility and facilitates community conversations on utility issues and advises on rate setting and project prioritization. This board has been in existence for over 20 years and is an integral part of the utility’s operation.

Website – We provide service information as well as educational information and project information on our website. To enhance the website experience, City Utilities just completed internal and external focus group sessions to issue a request for proposal to overhaul our website in 2020.

Print and Multimedia – City Utilities has expanded its print and multimedia presence through the publication of annual reports, posters, and TV content. These avenues allow the utility to expand customer education opportunities as well as highlight initiatives of the utility that generally do not receive much attention.

Presentations and curriculum - Fort Wayne’s active network of neighborhood associations provides an excellent vehicle for us to regularly interact with customers at neighborhood and quadrant meetings. City Utilities also has a rain garden program and offers rain garden workshops annually in the Spring to interested citizens.

Project meetings – Engineers working on projects are expected to meet with affected neighborhoods three times on major projects to receive information and work through issues. Once the project is bid and a

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FA<sup>34</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>35</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>36</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

contractor is selected, a “Meet the Contractor” meeting is held so that residents know who will be working in their neighborhood.

Bill Redesign – City Utilities contracted with a new bill print provider in 2017 which allowed the utility to redesign the bill customers receive to be easier to understand as well as more modern looking. At the same time, it was decided to stop using bill stuffers and redesign the back of the bill to include space where content could be changed out on a monthly or even daily basis to keep customers informed of the latest information or events.

Facility tours – Since 2012 Fort Wayne has been working diligently to reclaim the three rivers that flow through the city as a front door attraction. To highlight the relationship between City Utilities and the rivers, the Riverfront Fort Wayne organization and City Utilities partnered to promote monthly tours of the Three Rivers Water Filtration Plant and the Water Pollution Control Plant during the Spring and Fall months. Hundreds of citizens have toured both plants to understand the human-made water cycle.

Community events – City Utilities regularly participates in events sponsored by City departments and agencies, summer festivals, and trade shows such as the Parade of Homes focusing on home improvement and new home building. Each venue offers an opportunity for us to distribute information about a specific topic or program – related to the event.

AMI – We are upgrading to an Advanced Metering Infrastructure system beginning in 2020. We believe this is an important next step not only in keeping our infrastructure up to date, but also giving our customers the ability to make informed decisions about water usage.

Developing Future Talent – City Utilities is also proud to partner with Fort Wayne Community Schools Career Academy at Anthis for the last ten years to provide students learning the construction trades with opportunities to apply the skills they are learning by doing repair and restoration work following water main breaks or construction. City Utilities also partners with colleges and universities throughout the region to attract talent to our engineering department’s internship program; currently nine of the 36 engineering staff members are former interns and several more former interns working with firms that regularly do business with City Utilities.

Economic Development – Additionally, City Utilities protects its customer base through aggressive participation in local economic development efforts. We have been able to blend our resources with the local menu of economic development tools to add value to redevelopment, greenfield development, and placemaking projects, driving decisions that contribute to sustainable growth of the community and the utility.

Watershed Management – While not legally responsible for the local rivers nor required by regulatory agencies to provide watershed management, we play an important supportive role with the grassroots, agency-led organizations that have taken on watershed management and protection activities over the past 20 years due to our reliance on surface water for drinking water. We were a founding member of the St. Joseph River Watershed Initiative and as of 2016 provide administrative management. City Utility employees serve on the boards of the Upper Maumee River Watershed Partnership and the Tri-State Watershed Alliance.

### **Application Part 3: Activity Area - Partnering & Engagement**

The executive leadership team at City Utilities historically has always placed a high importance on customer and community engagement and partnership. This was further emphasized during the strategic planning process that took place in late 2016 and early 2017 which not only involved the executive team, but also stakeholder focus groups that resulted in several engagement goals being developed. While some of the activities are conceived internally, some are initiated by organizations reaching out to utility to partner on activities or programs.

Staff time is generally the largest commitment for the activities and programs that City Utilities implements. For years, the utility has had a stakeholder relations manager that has been the primary staff person involved in carrying out most of the engagement and partnership efforts. Additional staff members are also involved depending on the technical expertise needed for a given activity or program. The website overhaul, AMI system, talent development, and administration of the St. Joseph River Watershed Initiative all require or will require financial resources for implementation.

We have partnered with multiple stakeholder and organizations for several of our programs and activities as indicated in the activity and program descriptions above.

The most critical obstacle that City Utilities has had to overcome has been educating customers and stakeholders on the importance of the utility and all that it does and the need to invest in infrastructure. The stakeholder relations manager position has been key in engaging with customers and other stakeholders keeping customers and stakeholders aware of the programs and activities of the utility.

Smart technology will support future engagement with customers as our system is switched over to AMI. A customer portal will be available for customers to track their water usage in real time and alert them to leaks.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

City Utilities Website: <https://www.cityoffortwayne.org/utilities/city-utilities.html>

Rain Garden Website: <http://www.catchingrainfw.org/>

**Performance Measures & Results:**

<b>Measure</b> <b>What are you measuring?</b>	<b>Targets</b> <b>What was your goal/intended outcome?</b>	<b>Outcomes</b> <b>What were your actual outcomes?</b>
Engage stakeholders to better understand their perceptions and expectations so that we make well-informed decisions about our services and so that we maintain their trust.	Develop visually appealing written annual report for all stakeholders	Annual reports for 2016 and 2017 created and made available to all stakeholders, currently working on 2018 annual report
Empower stakeholders with information so they use water wisely and protect water quality through proper use of our wastewater system.	Consider more effective alternatives to Utility Bill Stuffers, including, but not limited to use of social media, and printing bill stuffer information directly on the utility bill	When the City Utilities switched to a new bill print provider in 2017, the back of the bills was redesigned to include information that was previously on bill stuffers. This has not only saved money on printing, but increased flexibility in messaging as information can be changed daily by billing cycle if needed.
Better inform customers relative to their use of resources enabling them to make more environmentally friendly decisions	Advanced Metering Infrastructure system procurement and implementation	City Utilities is currently in contract negotiations with a company. Implementation of the system is anticipated to begin in January 2020.

Enhance the ability of customers to gain access to FWCU information	Redesign City Utilities website to make information easier to find for customers and engineering/design companies doing work for City Utilities	City Utilities is currently in the planning stages to put a request for proposal for the redesign of the website, the project is expected to be completed in 2020
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# Genesee County District #3 Linden, MI

## Energy Efficiency



### Application Part 1: Background Information

Utility Name: Genesee County District # 3 Linden WRRF		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, storm water, etc.): <b>Single Plant</b>		
Service Area (square miles): 110 Square Miles	Average Annual Daily Flow or Demand (MGD): 4.2 MGD	
Population Served: 38,000		
<b>Location</b>		
Street Address: 6450 Silver Lake road		
City: <b>Linden</b>	State: <b>Michigan</b>	Country: <b>USA</b>
Zip Code/Country Code: <b>48451</b>		
<b>Utility Representative Contact Information</b>		
Name: Mark Earl	Phone: (810) 735-7135	Email: mearl@gcdcwws.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today?

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>37</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>38</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>39</sup> ( IGP)

The Genesee County Drain Commissioner's Division of Water & Waste Services operates the District # 3 Treatment plant which covers the southern portion of the County including the City of Linden, the City of Fenton, Fenton Township, and Argentine Township. The District # 3 treatment plant was first built in the 1960's with major upgrades in the 1970's, 1980's, 1999 and 2005. The 2005 upgrade brought in the flows from neighboring Livingston County which includes 2 Townships (Tyrone and Hartland Townships) and a septage receiving station. Initially septage flows were around 2 million gallons per year and have steadily increased each year. Now at around 30 million gallons per year the septage accounts for about 30% of the loading on the plant.

The Current treatment process includes a Biological Nutrient Removal Activated Sludge process followed by seasonal operation of twin Nitrification towers for Ammonia conversion. The Phosphorus limit in the summer is 0.5 mg/l and 1.0 mg/l during the cold months. The BNR system has been able to maintain an effluent Phosphorus level <.0.5 mg/l for the past 11 years without the addition of any chemicals. Disinfection is also chemical free as the process is completed through a UV system. The only chemical fed in the facility is a small amount of liquid polymer for solids thickening. The solids treatment includes Dissolved Air Flootation and Anaerobic digestion. The plant design flow is 11 MGD and the average daily flow is 4.3 MGD. In 2019 The treatment plant officially changed its name from a wastewater treatment plant to the Genesee County District # 3 Water Resource Recovery Facility and is also known as the Linden WRRF.

### **Application Part 2: Organizational Culture**

As a management focus the District # 3 WRRF has aligned itself wherever possible with the attributes of the Effective Utility Management (EUM) framework.

- Product Quality
- Customer Satisfaction
- Employee and leadership Development
- Operational Optimization
- Financial Viability
- Infrastructure Strategy and Performance
- Enterprise Resiliency

- Community Sustainability
- Water Resource Sustainability
- Stakeholder Understanding and Support

As a result of this Effective Utility Management effort the District # 3 WRRF was one of the two plants in Michigan selected to win the first ever Premier Utility Management Performance (PUMP) Award. This award was a joint effort by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and the Michigan Water Environment Association. (MWEA)

Product Quality is essential and compliance is a basic expectation for the Facility. This along with the satisfaction of the customer is the line Function of the organization. The receiving stream is a destination for paddlers and the enjoyment of that resource is a testament to the hard work at the plant.

The Employees are the backbone of the organization and it is a focus to ensure there is an investment into their training and futures so they are prepared to advance. The Michigan Water Environment Association Developed a Water Resource Recovery Technician (WRRT) Credential Program consisting of 8 courses and one seminar as a minimum. The District # 3 WRRF hosts in house each of the training courses required for the credential achievement which range from Fundamentals, Process training and Basic Management. By hosting these courses at the facility the employees have easy access to the training and are assigned to the training courses as a part of their normal work day. 80% of the Operations staff has completed the credential program and the number will be at 100% this year. There are also courses hosted at the facility by the Michigan Rural Water Association (MRWA) and BWMS Training as well throughout the year. There are online courses by 360-Water assigned to staff as part of their normal shift focusing on all aspects of the treatment process including some specific to the District # 3 WRRF. Currently all eligible employees are certified by the Michigan Department of Environment, Great Lakes & Energy (EGLE) in Wastewater Operations.

Regular staff meetings are scheduled which give the employees at every level the opportunity to weigh in on the facilities plans and provide input. The Division director holds meetings with the department heads of other facilities on a rotating basis which promotes unity and the sharing of information.

Leadership participation is encouraged in the Water Environment Associations at the State and National level. The sharing of knowledge and ideas in these associations is instrumental in developing leaders and a strong management team. Pulling people up is the way an organization can be effective for years to come. There is a graduate of WEF's Water Leadership Institute on the management team. Several members of the staff are involved in committees in the Michigan Water Environment Association including the Process Committee, Sustainable Energy Committee, Chair of the Lagoon Operators Committee and Co-Chair of the Industry Recruitment Committee. This type of leadership role in the recruitment arena is great for spreading the word about the industry and also provides an opportunity to seek out new talent.

Employee Safety is a priority within the organization and pride is taken in the implementation of the safety program. Employees at all levels have an active role in the safety process and participate with representation in the Division safety committee. In 2017 the District # 3 WRRF won the state (MWEA) and National (WEF) Safety awards due to an exemplary safety record. Currently the District # 3 WRRF is at 2,198 days (over 6 years) without a lost time accident.

In 2019 The District # 3 WRRF received a No Exposure Certification for Storm water by the State (EGLE) storm water division which demonstrates the commitment to the quality of the waters of the state.

Operationally the District # 3 WRRF is always trying to further optimize the treatment process and procedures. Current projects to better control the aeration system and RAS flow split will improve the efficiency and allow for a more precise tuning of the process.

The District # 3 WRRF management projects a 5-year Capital Improvement Plan each year with associated costs. There is an extensive annual budgeting process too. Every 5 years, the facility performs a rate study to determine revenues necessary for sustaining the operation, maintenance, and replacement of equipment, building, and associated piping. District 3 has very little long term debt and the County Agency has an A rating by Standard & Poors, and an A2 rating by Moodys.

Partnering & Engagement with the community is important and many steps have been taken to do this. Whenever the opportunity arises customers are encouraged to tour the facility. Schools and youth groups often tour the facility and typically result in a new found appreciation for the treatment process and facility. A developing partnership with the Shiawassee River Water Trail Coalition to Establish the WRRF's receiving stream as a National River Trail has been a great project to benefit the community and the Watershed users. The idea that the receiving waters are a destination by many and that this stretch of water has been called the most beautiful is something the employees can be proud of. The District # 3 WRRF has made improvements to an area along the river to increase public access including tree removal and planting of grass. The number and type of access points to the river is one of the first factors considered in the application.

The District # 3 WRRF is in the middle of completing a 20-year facility plan to establish the direction of future capital improvement needs, energy efficiency projects, green infrastructure, and improvement of the treatment processes. Continued monitoring of the energy and efficiency is proving to be a guide for new and refined ways of improving. This will provide the roadmap to continue being the Utility of the Future.

### **Application Part 3: Activity Area - Energy Efficiency**

Energy and sustainability have become a constant focus for the Genesee County District # 3 WRRF. In 2016 the District # 3 WRRF was successful in winning the MWEA Sustainable Energy award. Energy saving projects are always a target and several have been completed to date. Much work has been done with the utility company Consumers Energy on prescriptive and custom rebate projects. These projects have been chosen based upon the overall savings and the payback as well.

Evaluated the largest power consumption in the facility. (Aeration blowers) Determined there was an opportunity to save energy and it appeared to have a great payback.

Replaced two 250 HP Hoffman aeration blowers with 150 HP Lampson blowers to operate our aeration system 90% of the time.

The 2.81 year payback on the project saved 10% of the facility's electric costs (approximately \$45,000/year)

Took a look at other areas of the facility that appeared to have oversized equipment and developed a program to turn them into energy saving projects. Determined the RAS pumps were too large for the current return needs and the control valves were not operating in an appropriate range. (8-10% open)

Replaced two 32 HP submersible RAS pumps with two 7.5 HP submersible pumps with the realization that they will meet the RAS needs 90% of the time.

The 2.6 year payback saved approximately \$10,500 per year and the control valve began to operate in a more reasonable range around 50%.

Surveyed the natural gas usage and determined the process boiler was using an excessive amount. The utility company had prescriptive rebates for tune ups on boilers equaling \$800. The cost of the labor for the tune up work was approximately the same as the rebate.

The newly updated process boiler was able to be operated entirely on methane from the anaerobic digester it was used to heat.

The hot water in the boiler was also used to heat other parts of the plant further utilizing the savings.

Several important areas of the plant were using high pressure lighting that required a lot of energy. The length of time it took for the bulbs to warm up prevent immediate occupancy so the lights were regularly left on.

The old lighting was replaced with efficient LED lighting and was eligible for a rebate.

On top of the general electrical savings from the efficient style of lighting there was additional savings because the lights were now shut off when not in use.

The newest energy savings project is now under way to add aeration controls based on the DO and airflow needs of the activated sludge system. This will allow the airflow to be reduced further especially during the night when the plant is not staffed and save costs estimated at about \$80,000/year.

Midnight shift is unstaffed and that is the time when the greatest opportunity is for airflow reduction.

Adding the Ammonia monitoring/ airflow and DO control will provide the desired efficient operation of the system.

### **Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Planning began with an overall look at the energy costs and the areas that could use improvement. Rebate opportunities made these cost saving ideas more enticing and also helped to determine which projects to focus on. A simple payback that was too short made a project logical to do but rebate money wasn't available for them. Longer payback projects were not as inviting when there was low hanging fruit. The rebate option isn't the only reason to do an energy project but was a good guide to provide a plan.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Financially the projects were not large in scale but the payback was good. There was a lot of staff participation primarily on the management side. Engineering assistance was utilized and the utility company was a large help.

Did you partner with other stakeholders or organizations as a part of your implementation process?

There was a great partnership between the WRRF and the Utility Company. The initial power measurement and the post project verification was completed by the Utility Company representative and was instrumental in the project's success. The Utility Company also realized the value in networking with the WRRF's and the member Associations as well.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Timing and planning were probably the largest obstacles. The decision to do the projects was easy but the process to complete them without interrupting the treatment was important. Completing calculations and planning the specifics were time consuming and many meetings with staff, engineering and the utility were held.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

The projects were full of smart technology right from the beginning. Before the work is done, an estimate needs to be made of how much energy will be saved from the project. Monitoring the power to determine

the electrical usage and then using the post project monitoring for verification was crucial. Metering services were performed by Consumers Energy Business Solutions.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Information can be found from the Power Utility Company about rebates and energy incentive programs. The Electric Company used for these projects is Consumers Energy and their Consumers Energy Business Solutions (Energy Optimization Program) is a good resource. Michigan’s Public Act 295: “Clean, Renewable and Energy Efficiency Act of 2008” provided guidelines as well.

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
The reduction in kWh/year from the aeration blowers. (The largest energy consumer in the facility)	Estimated reduction was 465,000 kWh/year	Actual reduction was 563,330 kWh/year
The Cost to operate the Return Activated Sludge pumps.	Reduction in the kWh/year to operate the RAS pumps	130,695 kWh/year reduction equaling a \$10,455 cost savings.
The reduction in the facility’s natural gas cost after boiler updates and methane utilization.	Utilize the methane produced in the digester and reduce natural gas costs.	The natural gas usage dropped by an average of \$21,000 per year which is a 39% reduction.

# Great Lakes Water Authority, MI

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: Great Lakes Water Authority		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional water/wastewater system		
Service Area (square miles): 1,069 (water) / 988 (wastewater)	Average Annual Daily Flow or Demand (MGD): 2018 Average Daily Pumpage: 672 MGD	
Population Served: Approximately 3.9 million (water) / Approximately 2.9 million (wastewater)		
<b>Location</b>		
Street Address: 735 Randolph		
City: Detroit	State: Michigan	Country: United States
Zip Code/Country Code: 48226		
<b>Utility Representative Contact Information</b>		
Name: Michelle Zdrodowski	Phone: (313) 224-4739	Email: michelle.zdrodowski@glwater.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		

In what year did the utility achieve recognition as a Utility of the Future Today? 2018
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>40</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>41</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>42</sup> ( <input type="checkbox"/> IGP)

**Application Part 3: Activity Area - Partnering & Engagement**

GLWA’s collaborative relationship with our members is the bedrock of our operating philosophy. Our members include GLWA team members, board members, water and wastewater partners, associated stakeholders, elected officials, consultants and regulatory agencies. The Member Outreach Program is supported by neutral third-party facilitators, who help the participants build consensus, organize problem solving, perform brainstorming exercises and create a record of GLWA member interaction. The program has matured over the years to address important issues such as charges, contracts and system planning, as well as delivery of value-added improvements to member communities. The Member Outreach staff within GLWA works with the third-party facilitators to make the program a success.

The Member Outreach Program is comprised of multiple work groups, each having their own goals and desired outcomes. The work groups not only act as a source of information for members but allow for open dialogue, and for member concerns to be identified and addressed. The standing work groups are:

- One Water Partnership (big picture focus)
- Charges
- Capital Improvement Plan
- Communications
- Public Education
- Water Analytical
- Water Management Best Practices
- Water Quality
- Wastewater Analytics Task Force
- Wastewater Best Practices

In 2017, the first One Water Partnership Agreement was signed by GLWA and its members. This historic agreement outlines the mutual commitments to working together for the greater good of the region and details the responsibilities of all parties in moving the organization forward. A critical addition to the agreement is the development of a multi-jurisdictional, multi-agency approach to infrastructure renewal and investment. The agreement also highlights the rules of collaboration that we expect all participants of

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<sup>40</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.  
<sup>41</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.  
<sup>42</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

the Member Outreach Program to support and abide by. In 2019, the One Water Partnership voted into effect a new set of governing bylaws.

### **Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Many of the work groups have been functioning since 1997. New work groups are created as the need arises.

A significant amount of collaboration and planning is needed to make these work groups successful. Each work group not only has participation from our members, but also includes the following roles that are crucial to maintaining their balance:

**Member Sponsor** – A member partner representative that participates in the planning and setting of the agenda and provides member perspective on activities.

**GLWA Sponsor** – A GLWA team member that provides overall direction for the work group and is responsible for determining or approving agenda topics and assigning action items.

**Facilitator** - A member of the neutral third-party facilitation team that is responsible for ensuring and sustaining the rules of collaboration and furthering the transparent exchange of financial, programmatic, and technical information between GLWA and its members.

**Outreach Coordinator** – A GLWA team member that provides general work group oversight and support to all. Coordinates pre-planning meetings and assists with agenda development, as well as approving meeting summaries and following up with GLWA Sponsor on action items.

In the spirit of continuous improvement, GLWA rolled out a scorecard process in 2017 that was developed by member partners to evaluate the partnership by metrics derived specifically from the “voice of the member.” Using this measurement tool and ongoing communication of its results, GLWA ensures that all aspects of its operation understand the importance of the member partners’ perspectives on their work. The scorecard is intended to serve as an iterative “report card” for GLWA as an organization, revealing both points of pride and areas of opportunity for improvement – and, importantly, identifying year-over-year trends in member partners’ experience working with GLWA. GLWA is committed to ensuring that everyone in its operation understands the importance of feedback from its member partners using its Outreach Scorecard.

In recognition of the change in the relationship, when GLWA was launched the term of “customers” was changed to “members” to reflect the value we place on their voice in how we work together (a value-based not transactional relationship). This change of thinking has supported our members becoming even more involved and taking increased ownership in the system. The term “Member Partner” is used when referring to those entities that have a contract for water or sewer service with GLWA, and it is for their benefit and the benefit of the end consumer that GLWA looks to leverage its role in the region.

In January 2019, GLWA launched its regional training academy known as the “One Water Institute” (OWI). The OWI provides quality educational opportunities and leadership development to GLWA team members and member partners’ teams. This assists us all in continuing to grow operationally and professionally. The idea and plan to make the institute a regional training academy and offer courses to member partners stemmed from a need that was identified through the Water Management Best Practices Work Group. Courses are taught by GLWA’s Organizational Development Training team members, Michigan Water and Environment Association (MWEA) professionals, external consultants and online. OWI consists of six educational academies:

- Safety

- Water and Field Operations
- Wastewater Operations
- Technology
- Leadership Development
- The Leader-In-Me

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

The Member Outreach Program has just over a \$1 million annual budget, with more than \$700,000 going towards the third-party facilitator.

GLWA has an internal team dedicated to the Outreach program that works to coordinate the work groups, build relationships with members, and be a point-of-contact for GLWA team members and members, alike. These team members are in constant communication with the third-party facilitators to organize and plan for work group meetings, as well as discuss current concerns or issues members are facing. The member outreach team also receives the full support of GLWA’s Executive Leadership Team, which make it possible for the program to succeed.

Extension of the OWI to our member partners for its first year was budgeted at \$1 million and is expected to grow in subsequent years.

Did you partner with other stakeholders or organizations as a part of your implementation process?

GLWA recently transitioned from its long-tenure third-party facilitator to a new facilitation team. While the change of facilitators seemed daunting, GLWA made sure to include the outgoing facilitators and members in the development of the new RFP. To ensure the new third-party facilitators were the best team possible, the group assigned to evaluate bids was made up of GLWA staff, member partners and one of the outgoing facilitators. Once the new third-party facilitators were selected, a transition plan was put into place, with an intentional overlap of the incoming and outgoing facilitation teams. This overlap was key to ensuring members did not see a decline in the level of service and allowed the new facilitators to come alongside the outgoing facilitators and learn first-hand about the role. The third-party facilitator plays a key role in all functions of the Member Outreach Program. GLWA leadership often relies on the third-party facilitator for input and guidance on new and on-going initiatives and to promote collaboration between GLWA and all members.

The Member Outreach Program relies on the active participation of our members – a unique group that is made up of customer community representatives, consultants, regulators and other stakeholders like the Southeast Michigan Council of Governments (SEMCOG), as well as local universities.

Michigan Department of Environment, Great Lakes and Energy is a long-time partner and representatives are active members of the program.

Michigan Department of Transportation is also been involved.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

When GLWA launched in 2016, there was an already established Member Outreach Program that had been put in place as a result of a settlement agreement between wholesale water and wastewater customers and the Detroit Water and Sewerage Department (from which GLWA bifurcated to form the regional authority) that paved the way for the Member Outreach Program we have today.

At launch, the biggest obstacle of the program was to get all member communities to think regionally, instead of individually. The goal was to move them toward adopting a true “One Water” approach to the operation of the system. The result has been to work toward having all members committed to a “pipes

know no boundaries” philosophy where public investments already made are leveraged to the maximum benefit of the public as new investments are considered.

GLWA has positive momentum on this front thanks to its One Water Partnership Agreement (referenced in the overview paragraph). Working collaboratively with our members a mission statement was developed, “To collaboratively ensure a One Water system approach to our regional water and wastewater system that will be economically, socially and environmentally responsible and sustainable.”

Examples of GLWA leveraging its relationships and investments for the benefit of its member partners and the region include:

A partnership with an AI company where GLWA made an initial investment to become a sponsor of the program so that its members can get a significantly reduced subscription fee (pennies on the dollar); and,

A partnership to bring technology forums to its member partners so that they have access to the latest cutting-edge technology being used in the sector.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

GLWA has a dedicated System Analytics and Meter Operations team that offers key technology tools to our water and wastewater members. These tools are the Wholesale Automated Metering Reading (Water) and Greater Detroit Regional Sewer System (Wastewater) Portals. These portals provide customizable, web-based interfaces that display meter and member partner data in both graphical and tabular formats in five minute, hourly and daily intervals. In WAMR, members are alerted when high usage occurs to minimize water losses. Member can also take the data and use it as an input into their own control systems.

As a part of GLWA’s Wastewater Master Plan, real-time operating dashboards are being developed that support the initiative’s Regional Operating Plan for best water quality outcomes during wet weather operations.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

GLWA’s main website: [www.glwater.org](http://www.glwater.org)

One Water Partnership Agreement

Member Outreach Program Manual

GLWA’s Member Outreach Portal: [www.outreach.glwater.org](http://www.outreach.glwater.org)

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
System Reliability	Maintain pressure variance within 98% of required contract amounts	From March 2018 to 2019, met or exceeded 98%.
Member Partner Participation	100% of first-tier member partners to participate in a Member Outreach Program Activity	In 2018, 91% of our first-tier member partners were represented.

Workshops Hosted	Minimum of one workshop hosted in partnership with the Water Management Best Practices Work Group.	In 2018 workshops were hosted on water storage best practices and site sampling stations. A wastewater charges symposium was also hosted in 2018.
Interactions with GLWA team members: In general, team members are knowledgeable, responsive to member needs, prioritize effectively and get things done. (Member Outreach Scorecard)	Average rating of 4 out of 4 for agreement and satisfaction	Average 3.3 out of 5
Effectiveness of the Member Outreach Program: Opportunities to participate, third party facilitators engage members, valuable information provided, member voice is heard, co-chairs represent the interest of members. (Member Outreach Scorecard)	Average rating of 4 out of 4 for agreement and satisfaction	Average 4 out of 4
Charge Setting Process: effective member engagement, methodology aligns with regional vision, understandable and timeliness. (Member Outreach Scorecard)	Average rating of 4 out of 4 for agreement and satisfaction	Average 3 out of 4. Due to the timeliness of charges being adopted. GLWA made the commitment FY20 charges would be adopted in March 2019 and this was accomplished.
Collaboration Efforts: GLWA provides a good platform for regional collaboration, members are living up to the rules of collaboration, GLWA is a valuable resource to my community for joint problem solving and GLWA is implementing technology innovations that benefit members. (Member Outreach Scorecard)	Average rating of 4 out of 4 for agreement and satisfaction	Average of 3.17 out of 4
Satisfaction with GLWA service areas: Water Quality, Executive Leadership, Water Operations, Systems Control,	Average rating of 4 out of 4 for satisfaction	Average of 3.2 out of 4

<p>Wastewater Operations, Contract negotiations, Public Affairs, Finance, Field Services, System Analytics &amp; Meter Operations, Capital Improvements and Construction, and Procurement. (Member Outreach Scorecard)</p>		
<p>Satisfaction with GLWA’s information and communication efforts: Member Outreach Program communication, Wholesale Automated Meter Reading Portal, non-emergency issues, emergency issues, Greater Detroit Regional Sewer System Portal. (Member Outreach Scorecard)</p>	<p>Average rating of 4 out of 4 for satisfaction</p>	<p>Average of 3.4 out of 4</p>

# Gwinnett County Department of Water Resources, GA

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: Gwinnett County Department of Water Resources		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Multiple plants		
Service Area (square miles): 437	Average Annual Daily Flow or Demand (MGD): 71	
Population Served: 920,260		
<b>Location</b>		
Street Address: 684 Winder Highway		
City: Lawrenceville	State: GA	Country: USA
Zip Code/Country Code: 30045		
<b>Utility Representative Contact Information</b>		
Name: Tyler Richards	Phone: 678.376.6923	Email: tyler.richards@gwinnettcountry.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b>		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  __ Activity Area 1: Beneficial Biosolids Use		

Activity Area 2: Partnering & Engagement<sup>43</sup>  
 Activity Area 3: Energy Efficiency  
 Activity Area 4: Energy Generation & Recovery  
 Activity Area 5: Nutrient Reduction & Materials Recovery<sup>44</sup>  
 Activity Area 6: Water Reuse  
 Activity Area 7: Watershed Stewardship<sup>45</sup> ( IGP)

## Application Part 2: Organizational Culture

The Gwinnett County Department of Water Resources (GCDWR) is a publicly-owned utility, committed to providing excellent water services at the best possible value to the residents of Gwinnett County. The utility serves a growing population of over 920,000, with approximately 260,000 accounts in a 437-square-mile area just north-east of Atlanta, Georgia.

GCDWR has approximately 610 employees working in the areas of engineering and construction management, operations and technical services, facility operations and management, field operations, permitting and regulatory services, business and staff services, communications, and administration. GCDWR operates 2 water production facilities, 3 water reclamation facilities and 221 pump stations. In addition, GCDWR maintains 3,792 miles of water lines, 2,805 miles of sewer gravity lines, 280 miles of sewer force mains, and 1,558 miles of storm water pipe. GCDWR takes pride in stewardship of the environmental resources entrusted to us and pledge to be responsible as we manage water as a limited, but renewable, resource.

GCDWR is widely recognized for innovation and service excellence and has won over 150 awards for exceptional operations and permit compliance from the National Association of Clean Water Agencies and the Georgia Association of Water Professionals, as well as numerous awards from other associations.

### Internal Employee Engagement

Leadership at GCDWR is focused on increasing internal communications and employee recognition. GCDWR now holds quarterly town-hall meetings for all employees to attend. These meetings typically feature a few employees from different groups around the department. These selected employees share information about the major projects that they are working on, such as construction projects, new training opportunities, recent research developments, and more. This open meeting allows for questions and discussion while ensuring that employees from all divisions have an opportunity to learn about the goals of the department. In addition to these meetings, the department director, Tyler Richards, sends out a monthly newsletter called "Tyler Talks". This letter identifies major accomplishments from the previous month and calls out employees by name for exceptional efforts.

GCDWR continues to make strong investments in employee development and leadership. We believe in continual improvement through the personal commitment of our employees, education, efficiency and innovation. Through our graduated leadership program, employees are offered opportunities to increase their knowledge, develop and improve management skills, and maintain a safe working environment. In 2018, the department averaged 45 training hours per employee, with a 3-year average of 46 hours per employee per year. GCDWR budgets approximately \$1 million per year for employee training, conferences and professional development.

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<sup>43</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>44</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>45</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

Front-line supervisors complete ELITE training which consists of the Drug and Alcohol Free Workplace Policy, Unlawful Harassment Policy, FMLA, etc. Supervisors are educated on how to provide consistent and fair treatment to all employees. LEAD academy is the foundational management program. It consists of 16 sessions over four months that relate to culture and leadership. Topics include employment law, policies and procedure administration, communicating with a diverse workforce, managing an intergenerational team, etc. In addition, GCDWR provides management workshops such as 5 Choices to Extraordinary Productivity, 7 Habits of Highly Effective People and the Myers-Brigg Type Indicator. Seasoned managers are invited to participate in EXCEL, a program administered in conjunction with the University of Georgia's Carl Vinson Institute of Government. EXCEL provides a comprehensive program which focuses on producing competent and informed leaders. Managers participate in a final project which encourages professional growth and community involvement.

The Employee Skill Development (ESD) program is a competency based program designed to develop, train, and retain the highest quality employees. It provides a detailed progression plan for seven career paths with competency based advancement opportunities for employees. It utilizes standard operating procedures (SOP's), electronic operations and maintenance (EOM) manuals, and position specific online training. On-the-job skill-based training is completed and quality checked through the use of qualification cards. This is administered from a learning management system (LMS) that is readily available to the employee.

The training paradigm has shifted from the traditional classroom to blended training, which incorporates the use of computers and online knowledge based training. This provides them convenient access to training while reducing travel and off-shift training. There are currently 48 online training modules available and this highly successful program is growing.

Another employee development program recently implemented by GCDWR is the mentor/mentee program. Employees are encouraged by department management to participate in the structured program for a six-month period, evaluating the program and their mentor/mentee throughout the process. Mentors and mentees meet monthly (at minimum) to discuss challenges faced within the department and career progression.

GCDWR's robust safety training program strives to maintain a culture of safety within the workplace. All employees are expected to complete recurring safety training based on their position and exposure to hazards. All accidents and near misses are reviewed monthly by the Safety Committee. Employees are expected to complete remedial and/or applicable training to prevent future accidents and injuries.

GCDWR has consistently been recognized as a leader in the community and in water technology. Each of the treatment plants and filter plants has received multiple awards including certificates of achievement, Plant of the Year, and Platinum designation for the Peak Performance Award. In 2018, a water utility residential customer satisfaction survey by J.D. Power showed that Gwinnett had the happiest customers in the south. The survey measured satisfaction among customers of utilities serving at least 400,000 people in six key areas: delivery, price, conservation, billing and payment, communications, and customer service.

### **Application Part 3: Activity Area - Partnering and Engagement**

GCDWR submitted an application for the Partnering and Engagement award in 2017. Since then, GCDWR's Communications, Education, and Outreach team has grown significantly, allowing the department to greatly increase engagement with partners, customers, and the community.

GCDWR partners with many local and regional organizations such as Gwinnett Clean and Beautiful, Gwinnett County Department of Transportation, Gwinnett County Department of Solid Waste, Georgia Association of Water Professionals, North Georgia Metropolitan Planning District, and more. GCDWR

plans, advertises, and participates with these organizations on events, festivals, program development, and community outreach.

GCDWR has expanded its robust education program significantly over the last few years. These expanded activities include hosting a minimum of one stream clean-up each month (removing over 20,000 pounds of trash each year), presenting hands-on in-school programs to over 15,000 students each year, and hosting free community workshops each month on topics such as water conservation, septic tank maintenance, smart irrigation, fixing leaks, and backyard stream restoration.

GCDWR also hosts teacher trainings, orientations for new commissioners, and regulatory Q&A sessions with local cities. Bringing stakeholders to the department has brought increased awareness and attention to GCDWR's goals and messages.

In addition to education programs and workshops, GCDWR also hosts two large festivals each year. In the spring, the festival is held at one of the water production facilities and in the fall the festival is held at one of the wastewater treatment facilities. The events are open to the public and community leaders are formally invited. These festivals offer tours of the hosting facility every half hour throughout the event and attendees are invited to enjoy free food, play educational games that demonstrate the value of water, and visit booths hosted by various community groups.

In 2019, GCDWR unveiled a brand new external department website and was given access to use Gwinnett County's Facebook and Twitter page to post events and information. Both of these developments have been many years in the making and the new content and features on GCDWR's website has sparked a discussion among all County departments on how to better utilize web presence for the community.

## **Questions and Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Through years of partnering with and assisting our local and regional organizations, GCDWR has become a trusted community partner. In order to get involvement from organizations and to get interest from residents, it takes sustained and constant contact. Now that the Communications, Outreach, and Education team has been established for a few years, GCDWR has become a known partner in the community.

Since members of the team are a part of regional committees, such as the Georgia Association of Water Professionals Public Education Committee and the North Georgia Metropolitan Water Planning District Education Committee, the group has been able to see what other utilities in the region have implemented. Getting ideas from these other utilities has been crucial in developing and expanding GCDWR's engagement programs.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Despite recent growth, the Communications Outreach, and Education team at GCDWR is still a small group with limited resources. With four full-time staff and four interns, the team is one of the smallest in the department. It is through teamwork and partnerships that the group has been able to do so much. Pooling resources and sharing responsibility with event partners is necessary in order to have the ability to execute all of the many GCDWR outreach programs. It is also necessary to have leadership involvement. Without the full support of GCDWR leadership, the Communications, Education, and Outreach team would not even exist.

Did you partner with other stakeholders or organizations as a part of your implementation process?

As mentioned above, GCDWR partners with a variety of other departments and organizations. It is best to locate partners that have similar goals. For example, GCDWR works heavily with Gwinnett County

Public Schools, teachers, and administration to promote and create our in-school education programs. GCDWR also organizes many large clean-up events with Gwinnett Clean and Beautiful. GCDWR established these partnerships because the programs presented meet the needs of both organizations. At the smart irrigation and water-wise landscaping workshops, GCDWR partners with local Master Gardeners. For a workshop on rain gardens, GCDWR will host the workshop at the Horticultural Gardens at a local college, Gwinnett Technical College. Most of the other workshops are planned with and held at a local library.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Lack of staff and resources has always been the obstacle for this Activity Area. However, as mentioned above, relying on partnerships and having the support of department directors makes it easier to do more than what can be done alone.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Our efforts in this Activity Area are not supported by “smart” technology.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Please visit our website, [www.gwinnettH2O.com](http://www.gwinnettH2O.com) and click on “Get Involved” to see our upcoming events and workshops. To see the Metropolitan North Georgia Water Planning District’s water resources plan, including requirements about partnerships, education, and engagement, please visit <https://northgeorgiawater.org/plans-manuals/>.

### Performance Measures and Results

<b>Measure</b> <b>What are you measuring?</b>	<b>Targets</b> <b>What was your goal/intended outcome?</b>	<b>Outcomes</b> <b>What were your actual outcomes?</b>
Number of partnered events participated in each year	At least 20	45
Number of students reached by GCDWR education programs each year	At least 10,000 each year	Over 15,000
Number of free workshops offered to residents each year	At least one per month (on average)	19
Number of volunteer stream and watershed clean-ups hosted each year	At least one per month (on average)	14
Pounds of trash removed through volunteer efforts each year	At least 20,000 pounds	26,355 lbs.
Number of specific projects completed associated with a partnership	39 (4 speaker bureau, 10 cleanups, 19 workshops, 2 festivals, 4 events)	48
Number of articles published each year	12	23, plus another 16 event listings that are like notifications

# Houston Water, TX

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: Houston Water		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Multiple Plants		
Service Area (square miles): 600	Average Annual Daily Flow or Demand (MGD): 240	
Population Served: 2.2 Million		
<b>Location</b>		
Street Address: 611 Walker Road		
City: Houston	State: Texas	Country: USA
Zip Code/Country Code: 77002		
<b>Utility Representative Contact Information</b>		
Name: Paul Zappi	Phone: 832-395-5473	Email: paul.zappi@houstontx.gov
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2018		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>46</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>47</sup> <input type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>48</sup> ( <input type="checkbox"/> IGP)		

## Application Part 2: Organizational Culture

Houston Water, within the department of Houston Public Works (HPW), is managed in accordance with a threefold task of ensuring public health, protecting the environment, and providing superior customer service. These meaningful core undertakings are also captured in our organizational mission statement. The executive team has cultivated an organizational culture based on a commitment to performance excellence through competence, continuous improvement, innovation, courage, integrity, selfless service, stewardship, and teamwork. Houston Water leadership is focused on the community and strives to promote a collaborative work environment while treating water and wastewater in an effective, efficient, and responsible manner to serve Houston’s citizens.

To aid in strengthening our workforce, an innovation group was created to develop a performance incentive management process. The goal of the group is to design a transparent, impartial, and cost-effective performance incentive program with an attitude towards customer service excellence and an emphasis on the department’s core business objectives. The process will not only increase the productivity and quality of work performance, it will enhance employee efficiency while retaining a high-performing workforce.

In order to engage employees in the performance process, Houston Water implemented 360 Evaluations. This management developmental tool allows personnel in supervisory positions to assess themselves as well as be evaluated by their direct reports. All employees are encouraged to continuously grow and develop. In turn, HPW provides various in-house training programs to enhance technical and professional skills. These classes are offered at no cost to the employee and include courses for technical license renewals, Microsoft Office, resource management, resume writing, and interviewing skills. Additionally, leadership development seminars are offered where participants learn from peers in current and related departments. This encouragement for growth also extends to participation in industry conferences, authoring of homogeneous publications, and to serving as chairperson or leadership in other organizations. Houston Public Works is constantly working to develop and train its employees to ensure

<sup>46</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>47</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>48</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

that all personnel are efficient, effective, and satisfied with job performance. As such, succession planning and advancement opportunity is at the forefront of several initiatives.

Houston Water has an active social media presence where it spotlights employee efforts and department initiatives. For example, the Adopt-A-Drain program was created to reduce flooding by allowing citizens to search for the drain nearest to their residence, take ownership of it, and name it. Ownership requires the participant to commit to cleaning 10 feet on both sides of their drain at least four times per year and compost the debris or place collected leaves in a lawn bag. "It's Draining Men", "Sir Drains a Lot", and "Calvin and Hobbs" are just some of the hilarious nicknames people have suggested or named their drains. The program was just one of the innovative solutions presented at the 2017 Houston Hackathon. Hackathon is the platform Houston's "civic hackers" use to pitch ideas and display innovative new websites, mobile apps, and insightful data visualizations that address community and City problems.

In addition to employee development and community outreach, Houston Water strives to include sustainable practices in all aspects of operations. It is one of a handful of agencies using Envision and has Envision sustainability professionals on staff. Envision provides guidance on sustainable best practices and serves not only as a planning and design tool, but also as a means of evaluating completed infrastructure projects and operations.

Houston Public Works is the nation's largest department to receive the American Public Works Association (APWA) accreditation. Several of the City of Houston's existing practices are exceeding the APWA's expectations and over 35 are recognized as role model practices.

The City recently announced development of the Houston Water Innovation Hub. The Hub is a first-in-the-nation, urban water demonstration site and showcase mechanism for global, national, and home-grown breakthroughs. Both emerging and proven technologies are emphasized. One of the inaugural proposals focuses on sludge and biosolids management. Innovation Hub demonstration projects began in Summer 2018.

Houston Water believes its organizational culture has fostered an atmosphere for customer service excellence, employee engagement, and innovation that not only enhances the lives of all Houstonians but also has a positive impact on the world.

### **Application Part 3: Activity Area - Partnering & Engagement**

The description includes three main components:

Overview Paragraph:

Peer-to-Peer Exchange

*Resilient Cities* – 100 Resilient Cities is an initiative dedicated to helping cities around the world become more resilient to the economic, physical, and social challenges that are a growing part of the 21st century. Houston is investing financial, intellectual, and political capital not only in "building back" but also in "building forward". We are strengthening long-term resilience by redesigning infrastructure, accelerating an affordable housing strategy, leveraging innovative partnerships, and coordinating regional policies. For example, the City of Houston has a Resilient Cities collaboration with the country of Denmark which focuses on water resilience. This partnership is a knowledge-sharing exchange in which participants from Houston and Denmark discuss approaches, challenges, best practices, and lessons learned.

*LIFT SEE IT* – The Leaders Innovation Forum for Technology (LIFT) Scholarship Exchange Experience for Innovation & Technology program (SEE IT) is an initiative that provides scholarships for utility personnel to visit other utilities with innovations of interest and to share those experiences with their peers. LIFT SEE IT provides hands-on interaction with innovative technologies and approaches with representatives who are implementing them to provide participants with the needed perspectives and

information to accelerate adoption at their own facilities. Houston Water is a recent recipient of this scholarship and is currently participating in an exchange with two utilities.

*Professional Organizations* – Professional organizations provide opportunities to further knowledge, skills, interests, and engagement. Houston Water personnel are extremely active in several state and local professional organizations (e.g., WEAT, WEF, AWWA, TPWA, and APWA). Many employees hold offices, participate on panels, deliver presentations at technical conferences, and write articles for industry magazines and publications.

*Professional Organization Awards* – Houston Water has a particular interest in recognizing individuals and groups within its organization. An awards committee was formed to research and prepare award nominations to broadcast to the local and regional stakeholders Houston Water’s approach, techniques, and work ethics. Over the last 12 months, Houston Water has received several awards from organizations such as the Water Environment Association of Texas and Texas Public Works Association.

*Technical Conference Presentations* – In an effort to exchange information and ideas with other utilities, consultants, and manufacturers, several Houston Water employees have made presentations at state and national level technical conferences such as Texas Water, CMOM, WEFTEC, and ACE.

*Utility Exchange* – Houston Water has been an early adaptor in embracing new technologies and in recent years has focused on building a Digital Utility Framework (DUF) by integrating its progressive operators and in-house advanced planning and analytics team. The initiative also encompasses collaboration with academia and research institutes, innovative companies, major utilities, and professional engineering consulting communities. The overall objectives of the DUF are to effectively address emerging challenges that Houston Water and other water utilities are encountering.

Houston Water is utilizing emerging techniques and technologies to build a digital insightful knowledge-based platform for on-demand operational decision-making with an informed long-range impact of the decisions. The platform integrates all operational databases that are maintained by Houston Water to capture day-to-day activities and to record performance of the system. The platform provides the foundation for developing productivity tools and automated decision-making systems to empower employees for effective management of the utilities.

Inspired by the outcome of Houston Water’s initiative, DC Water and several other utilities in the nation has expressed their interest to implement similar processes and organizational models in their utilities. Houston Water is currently collaborating with DC Water to share its experience and will soon start with other utilities such as MSD Cincinnati, Clean Water Services, etc. The overall objectives also include learning from each other to consolidate and strengthen experiences through a collaborative platform.

## Media

*Facebook & Twitter* – The Houston Public Works Communications team has revamped Houston Public Works’ social media presence to include even more highlights of employee efforts and department initiatives. The team has increased followers on Facebook by over 350% in the past two years. These platforms have allowed for continued engagement with the community and broadcast news updates to a larger audience as well as the ability to share upcoming events related to Public Works. The Communications team has created themed days such as Man Crush Monday, Women in Wastewater, Water Wednesday, and Women’s Crush Wednesday as ways to highlight our staff.

*Local News Media* – Houston Public Works has renewed trust with the local media and has built strong relationships with them to assist in the promotion of positive and proactive stories. As such, the number of positive stories has increased tremendously. This has allowed the narrative to change from a reactive stance to one that showcases behind the scenes action and highlights the hard work which is often taken for granted or goes unnoticed.

## Community Outreach

*WaterWorks Education Center* – Houston Water’s WaterWorks Education Center features interactive exhibits and fun educational activities for kids of all ages. The WaterWorks Education Center opened in October 2010 with a mission is to promote water education, conservation, and stewardship. Visitors to the education center can learn about Houston’s drinking water supply, the science behind it, and wise consumption practices.

*Water Festivals* – For over 20 years, Houston has held a WaterWorks Festival where engaging water professionals and environmental exhibitors share information about our water supply, water and wastewater systems, and the importance of water conservation. This year’s theme was “Careers in STREAM” based on Science, Technology, Reading, Engineering, Art, and Math. The event educates the community on the City’s high-quality drinking water, water conservation and efficiency initiatives, wastewater treatment system, Corral the Grease program, and other sanitary sewer overflow prevention methods.

*Facility Tours* – Houston Water has 39 wastewater treatment plants that collect and treat an average of 250 million gallons of wastewater per day. Along with 383 lift stations, the sanitary sewer collection system moves wastewater to the local treatment plants where it can be treated and safely returned to bayous and lakes. Wastewater plant tours are available to schools, civic groups, international delegations, and others upon request. Participants are able to learn about the drinking water and wastewater processes as well as receiving a guided tour at one of our award-winning plants.

*Corral the Grease* – The City of Houston’s Corral the Grease program helps educate residents on ways to prevent plumbing blockages and sanitary sewer overflows by properly disposing of fats, oils, and greases (FOG). The program also informs the community on ways to dispose of other household items such as coffee grounds, paper towels, diapers, and feminine hygiene products that can block plumbing and sewer lines. A blocked sewer line can cause an overflow that sends pollution to our bayous, creeks, and streams. By properly disposing of grease and other items, residents can not only keep sewer lines unclogged but they can also assist in the protection of Houston’s natural environment as well.

*Adopt-A-Drain* – The Adopt-A-Drain program was created to allow the community to help reduce flooding by motivating individuals to search for a storm drain near their home or business, take ownership of it, and name it. Ownership requires the participant’s commitment to cleaning 10 feet on both sides of their drain at least four times per year and to compost the debris or place collected leaves in a lawn bag. Adopt-A-Drain was just one of the innovative solutions presented at the 2017 Houston Hackathon. Hackathon is the platform Houston’s “civic hackers” use to pitch ideas and display innovative new websites, mobile apps, and insightful data visualizations that address community and City problems. Over 1,400 drains have been adopted to date.

*B Better Conference* – Vice Mayor Pro-Tem Jerry Davis hosted the second annual conference B Better Conference to give hundreds of aspiring middle school students an opportunity to turn their career and life aspirations into reality, especially at a point in their career where they need to consider attending high schools with a career focus (e.g., STEM and medical). Houston Water assisted in hosting one of the break-out sessions focused on opportunities at all levels in the water industry.

*Texas Water Conference* – Houston Water hosted the 2019 WEAT/TWWA annual water conference for the first time in several years. Water and wastewater utility directors served as co-hosts for the conference while numerous Houston Water employees volunteered to help organize and conduct the conference.

*Student Interns* – Houston Water utilizes numerous interns from both Houston Community College (HCC) and Houston Independent School District (HISD). Each semester, several students are called upon to work for Houston Water’s water and wastewater facilities. These efforts help to educate area students about opportunities in the water industry and gives them invaluable work experience.

## Rebranding

*Logo* – In March, Houston Public Works launched a new logo and brand for the entire department. The new logo called “Together” represents the many service lines that comprise Houston Public Works and makes us whole. The Department also launched a singular new purpose with the rebrand, “Together, we create a strong foundation for Houston to thrive”. The new purpose unites the department in a common goal.

*Five to Thrive Values* – Houston Public Works recently consolidated its department’s values to include Integrity, Teamwork, Ownership, Communication, Respect.

*TRANSFORM* – TRANSFORM is a new initiative that unites various staff into one team for the purpose of creating a strong foundation for Houston to thrive. The focus of TRANSFORM is to establish the best place to work by placing our employees first and developing better leaders.

### **Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Did you partner with other stakeholders or organizations as a part of your implementation process?

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Houston Water focuses on collaborating with stakeholders to enable it to meet its goals. A Triple Bottom Line approach has been used to establish these goals; an approach that aims to enhance the overall environmental, economic, and social wellbeing of water utility customers and the region as a whole. As noted above, Houston Water often partners with other utilities, its customers, and other organizations when working toward these goals; a path that involves frequent and multiple types of engagement, involving the appropriate stakeholders at the appropriate times.

Implementation involved seeking out key employees and volunteers that had a passion for the Houston Water partnering and engagement activities, as well as a multitude of skills; some on an individual basis and some as an organization. With these players in place, the utility repeatedly committed a more than adequate level of resources to encourage partnering and engagement activities. For example, sometimes activities involved utilizing contract services.

While some of Houston Water’s partnering and engagement activities are focused solely on partnering and/or engagement, many of these activities are part of larger effort. Therefore, identifying specific resource commitments can be difficult. However, in general terms, on the order of 10% of supervisors’ time is spent on such activities. On the order of 20% of managers’ and directors’ time is spent on such activities. Greater percentages of labor hours are spent by supervisory and staff level employees with more focus on P&E activities (e.g., public relations group, Corral the Grease program manager, intern interview panels and supervisors, plant tour guides, etc.).

Several organizations that Houston Water has partnered with are identified above (e.g., HCC, HISD, WEF, WEAT, AWWA, and APWA).

The most critical obstacle that Houston Water had to overcome when focusing on partnering and engagement was breaking down the silos that had developed over the years of changes, rapid city/utility grow, etc. However, the content of many of these silos was more than anyone could expect; a reflection of the supervisor and staff level employees that have worked at Houston Water over the years.

See Overview Paragraph for an introduction to the types of technologies utilized.

The link for Houston Wastewater Operations is:

<https://www.publicworks.houstontx.gov/pud/wwops.html>

Also, search for links to the organizations and events cited above.

### Performance Measures & Results

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Number of Partnering Projects	Minimum of One New Project Per Year	Executing several new projects (e.g., Resilient Cities, LIFT SEE IT, Transform, and B Better)
Number of Engagements	Minimum of One New Engagement Effort Per Year	Houston Water hosted Texas Water 2019
Recognition of Partnerships by Outside Organizations	Written Communication, Award, or Other Form of Recognition, Minimum of One per Year.	WEAT membership recruiting award for Wastewater Director
Outreach Effectiveness	Real/Quantitative Measure of Effectiveness	350% percent increase in Facebook activity
Number of Outreach Events	Minimum of Three Events per Year	Numerous professional conference presentations, numerous facility tours, and several HCC/HISD interns.

# Kings County Wastewater Treatment Division, WA

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: King County Wastewater Treatment Division		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional System		
Service Area (square miles): 424-square-miles	Average Annual Daily Flow or Demand (MGD): 179 MGD	
Population Served: Approximately 1.8 million people		
<b>Location</b>		
Street Address: 201 S Jackson Street, Suite 500		
City: Seattle	State: WA	Country: USA
Zip Code/Country Code: 98104		
<b>Utility Representative Contact Information</b>		
Name: Sue Meyer	Phone: (206) 477-5543	Email: Sue.Meyer@kingcounty.gov
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today? 2016

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>49</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>50</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>51</sup> ( IGP)

## Application Part 2: Organizational Culture

King County's Wastewater Treatment Division (WTD) operates around the clock to sustain a healthy environment. Our vital infrastructure supports economic development that enables our region to thrive. WTD's Mission is to protect public health and enhance the environment by collecting and treating wastewater while recycling valuable resources for the Puget Sound region. We provide wholesale wastewater treatment services to 34 local sewer districts and cities, including the City of Seattle, and treat 179 million gallons of wastewater each day for more than 1.8 million residents across a 424-square-mile area and three counties.

The division's 700 employees plan and design new facilities, regulate the disposal of industrial waste, educate the public about pollution prevention, and manage a regional system of treatment plants, pipelines and pump stations that operate around the-clock. Guided by a commitment to sustainable communities, WTD remains focused on resource recycling and renewable energy production as part of its effort to attain carbon neutral operations. WTD has earned Platinum Peak Performance awards from NACWA for permit compliance at our Vashon and South Treatment Plants for more than five consecutive years.

WTD embraces the ideals of the Utility of the Future Recognition Program. We are a forward-thinking, innovative water utility that provides resilient value-added service to our community. The practices and programs described below sustain the organizational cultural that allows WTD to successfully pursue opportunities in the Utility of the Future activity areas. These practices and programs are organized into two areas: Best-run Government and Workforce and Leadership Development. Best-run Government

WTD has fundamentally transformed many of its internal processes to make them more efficient, responsive, and transparent. This has decreased our costs and improved customer satisfaction. Below are examples of how WTD is helping King County meet its goal of being a best-run government.

### Strategic Planning

<sup>49</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>50</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>51</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

In 2019, WTD launched The Clean Water Plan, a wastewater comprehensive plan that will outline WTD's future and address broader water quality concerns for decades to come. We are convening a regional conversation to understand all stakeholders' priorities and plan to make sure we are incorporating values and voices that represent the diversity of the region in the planning process. The Clean Water Plan will ensure that we are making the right investments at the right time.

### Portfolio Management

WTD conducted a Portfolio Management Pilot Program in 2017 and 2018 to support development of its 2019-2020 capital budget and its 2019-2024 six-year capital improvement program. Portfolio Management is a system that is used to deliver the right programs and projects at the right time for the right reasons. It provides coordinated, balanced, and transparent management of portfolios and sub-portfolios of programs and projects to better achieve an organization's strategic objectives through prioritization, resource balancing, and continuous improvement. Portfolio management provides a rational framework for prioritizing projects and allocating limited resources while maintaining an organization's mission and integrity. WTD is currently transitioning from a portfolio management pilot state to a steady state of portfolio management practice and culture.

### Lean

In 2018, WTD hired a Continuous Improvement Program Manager dedicated to improving our internal processes. The division has outlined a Lean Journey and developed a comprehensive Maturity Model to track it. We are focusing on standardizing daily management practices, which includes Visual Management, and Team Huddles, to encourage a proactive problem solving team mindset and enhance team communications. WTD is also providing Lean certification classes and a Continuous Improvement mentoring program. We plan to have 20 practicing Lean practitioners by the end of 2020.

### Bright Ideas

Bright Ideas is the program we set up to capture employee-generated ideas for innovation and improvement. Recent enhancements to the program include creating a review panel and improving communication about the decision process by adding feedback loops at each stage. The database was also expanded to capture employee suggestions for organizational improvement and process improvement data and allow for better reporting capabilities to make it easier to share our improvements, identify trends, and tell our story.

### Technology Assessment and Innovation Program

The WTD Technology Assessment and Innovation Program (TAIP) is a dedicated group within WTD that provides technical services to stimulate innovation, build a sustainable and resilient future, advance resource recovery, and maximize the cost-effectiveness of WTD services. Their work includes assessing new wastewater treatment technologies, optimizing existing treatment processes, conducting pilot and demonstration scale testing, and performing technical studies and evaluations. This group tracks and contributes to innovation in the wastewater industry.

### Employee Engagement

In order to support continuous improvement at WTD, leadership provides multiple avenues for staff to provide feedback. There is an annual employee survey with questions ranging from peer culture to job satisfaction to leadership communication. In 2019, WTD had a response rate of 84%. Additional highlights include leadership team listening sessions, all-hands meetings, and a weekly email update to staff.

## Good Neighbor

WTD is committed to being a good neighbor and works to promote effective engagement and customer service in the communities it serves. Every two years, WTD conducts a near neighbor survey to get feedback from the people who live and work near our treatment plants. Questions enable respondents to describe their perceptions of our plants and to share opinions about how they are operated. The survey helps us identify opportunities for improvement.

## Workforce and Leadership Development

WTD has a robust workforce and leadership development program in place to assure the recruitment, retention, and development of staff. Below are recent examples of WTD's progress in workforce and leadership development.

## Equity and Social Justice

WTD believes that the principles of equity and social justice (ESJ) are fundamental to a healthy organizational culture. All employees are required to take ESJ training and employees are expected to meaningfully incorporate ESJ principles and practices into their work. Successes to date include the creation of a WTD ESJ Committee with an ESJ-specific work plan, a capacity charge affordability study to assist low-income customers, improved procurement requirements and policies that help Minority Owned Businesses and Women Business Enterprises, and updating hiring practices that are more equitable.

## Leadership Team

WTD is supporting the growth of our leadership team by standardizing supervisor expectations, providing training in diversity hiring and micro-aggressions, and providing conflict resolution training. We plan to extend these trainings to all staff, thereby grounding us in common language to better discuss issues of inequity and work through differences of opinion.

## Internship Opportunities

WTD has a successful internship program. The WTD Education and Outreach Team partners with the Mountains to Sound Greenway Trust to provide a high school summer paid internship program. In 2019, we plan to hire 12 interns. We also have a paid College Internship Program designed to provide undergraduate and graduate students with professional experience in the wastewater field. The program creates a pipeline to attract and encourage talented students to pursue a career in wastewater and is an important tool for recruiting recent graduates. For the 2019 summer season, WTD is hiring 18 students.

## Operator-in-Training

The Operator-In-Training (OIT) Program has been established to prepare for succession planning, and the transfer and retention of critical organizational knowledge held by current long term employees. The six-month position includes on-the-job and classroom training necessary to earn a Washington State Department of Ecology OIT Certification. In 2019, WTD will hire 10 – 12 staff into the OIT program.

## NACWA Core Growth Leadership Development Program

WTD has participated in the NACWA Core Growth Leadership Development Program since its inception in 2017. WTD graduated a total of six staff from the program's 2018 and 2019 classes. Through this 6-month program, emerging leaders from WTD and other regional utilities identify their personal leadership styles, learn from executive leaders in participating utilities, work with mentors in their organizations who provide leadership guidance and assistance with individual development plans, and complete an industry-specific capstone project. Working with emerging leaders in other utilities allows WTD staff to share knowledge, exchange ideas, and build relationships that can support future collaboration.

## Balanced You – Employee Wellness Program

In 2018, King County launched Balanced You, a fresh approach to employee health and well-being designed to meet the whole-health needs of King County's diverse workforce. Inspired by employees, Balanced You equips employees to live healthy and safe, know and use their benefits, and find balance in life and work. Balanced You provides employees with access to tools, resources and programs that can help them have healthy minds, bodies, ways to manage money, and healthy connections to friends and family.

## Worker Safety Program

WTD is committed to workplace safety. Our policy is that no job is so important that we cannot take the time and effort to do it as safely as possible. WTD's Safety Program includes seven employees that are dedicated to this commitment. WTD currently uses on-line communications systems to track and notify staff of robust safety training requirements, share training policies and procedures, share on-line training opportunities and easily allow staff to report any incidents.

### **Application Part 3: Activity Area - PARTNERING & ENGAGEMENT**

King County WTD proactively engages with the community we serve. We cultivate broad and deep partnerships with community organizations, partner utilities, schools, and individual residents and ratepayers. Our many partnerships and robust engagement promote a triple bottom line framework. Together, the environmental, social, and economic sustainability practices of WTD support thriving, resilient neighborhoods and communities throughout the Puget Sound region. Some notable examples of partnerships and engagement include the following.

Community Services program that provides proactive outreach and engages residents and communities impacted by our operations and capital projects.

Education program that works independently and in partnership with local non-profits to educate and motivate a diverse community to act as stewards of our water resources.

Clean Water Ambassador Program, in partnership with Mountains to Sound Greenway, that provides paid internships to high school students. Interns gain a deep understanding of water quality issues and career opportunities related to water quality.

Partnership with Seattle Public Utilities, whose service area contributes most of our combined sewer overflow, to fund community-based solutions to stormwater. Our co-branded RainWise program provides rebates for residents living in targeted combined sewer overflow basins to install rain gardens or cisterns.

WaterWorks grant fund that provides funding for projects led by community partners that aim to improve water quality outcomes within our service area.

Engaging and informative social media sites including Twitter, Facebook, Instagram, Flickr, and YouTube.

Partner with the University of Washington Department of Civil and Environmental Engineering in a Graduate Research Fellowship Program that funds two graduate students to conduct applied research on topics of interest to our operations.

Operate CitySoil Farm, a demonstration farm located at our South Treatment Plant, in partnership with a gardening education and landscaper job training non-profit and conservation district. Crops are grown on the farm using biosolids compost and recycled water and donated to a local food bank.

Work launched this year to update our 20-year old comprehensive plan for wastewater treatment. The Clean Water Plan includes strategies for robust stakeholder and community involvement.

## Question & Answer

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

WTD has realized many benefits from partnering and engagement with a variety of stakeholders. Implementation varies widely depending on the activity. Some similarities across all activities and practices include dedicated resources (both financial and staff), a project champion at the agency who will push through setbacks, clear expectations of what success looks like, seeking out similar examples (internal and external) and incorporating any lessons learned, and input from all affected parties and stakeholders.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Engaging stakeholders and neighbors of our facilities has been a long-standing priority of WTD.

We have a dedicated Community Services Group that supports WTD by informing and educating the public about our operations and services; promoting public participation in decision-making; and responding to the concerns and issues of residents, organizations and businesses. Currently, the group has 12 dedicated staff to support our capital projects and operations. Financial resources are accounted for in capital project budgets and to a lesser extent in our operations budget. An interesting resource to highlight for this group is a collaboration with the WTD Asset Management Group and their CCTV truck. WTD has incorporated the use of the truck into community events and fairs, allowing visitors to see what the cameras look like and how they work – it is a hit!

The mission of the Education and Outreach Group is to educate and motivate a diverse community to act as stewards of our water resources. This program currently has eight staff. A significant resource to highlight for our Education Program is the Brightwater Education Center. Opened to the public in 2011, the center is a hub for many of our educational opportunities and community events. It includes 70 acres of public open space with three miles of walking trails and 40 acres of natural habitat, a community center with rentable meeting rooms for the public and a clean water learning space featuring learning opportunities in both indoor and outdoor settings. Tours and learning opportunities are also available at our other treatment plants and facilities. This includes the CitySoil Farm, a 1.5 acre demonstration farm that incorporates the use of biosolids and recycled water. It is located at our South Treatment Plant and is run in partnership with three other local organizations for education purposes and to demonstrate the potential for more community food projects in King County.

Did you partner with other stakeholders or organizations as a part of your implementation process?

Ensuring that the correct stakeholders and/or organizations are included in activities is important for success. WTD has a variety of partnerships including community organizations, partner utilities, schools, and individual residents and ratepayers. The examples provided above highlight many of the partnerships that help us implement our programs and outreach.

Since our last application as a Utility of the Future, WTD has focused resources on improving diversity, equity and inclusion in relation to not only our organizational culture, but also our engagement and partnerships.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

The RainWise program, in partnership with Seattle Public Utilities, provides rebates to cover most or all of the cost of installing cisterns and rain gardens on private property. WTD found that investing in green stormwater infrastructure was both time consuming and costly for homeowners, creating a barrier for would-be participants. Many potential recipients could not afford the upfront cost and wait for the rebate.

In response, WTD created a program called Green Stormwater Infrastructure Mini Grants to provide up to \$1,500 to landowners and up to \$4,500 for income-limited landowners to cover initial costs.

As with many of our capital projects, and even more so with the Clean Water Plan, a critical obstacle to engagement is getting the community and stakeholders involved early in the process. The community will typically get involved when they see the surveyors visiting sites or the construction crews mobilizing. However, planning for WTD programs and projects is done far in advance of construction and stakeholder engagement can be difficult. Some approaches that WTD has taken include: going to stakeholders (attending already scheduled monthly community meetings, visiting near neighbors, and hosting pop-up booths at local coffee shops, fairs and festivals), providing on-line open houses that stakeholders can visit when time allows, and providing specific hotlines for projects. As with all our communications, WTD works to incorporate culturally appropriate, plain language that is translated to meet community needs.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

The WaterWorks Grant Program started in April 2015 to support sound investments in clean water and the community. Staff quickly realized that information technology would be needed to track and review the approximately 80 grant applications received each grant cycle. In 2017, WTD purchased grant tracking technology. This technology has allowed us to more efficiently track all applications and allows reviewers to comment in real time. The additional staff time has been spent better supporting applicants (including community groups that lead with equity and social justice). WaterWorks has funded 105 projects since 2015.

The Community Services Group realized that traditional open houses were not allowing many stakeholders and community members to engage in the outreach process. WTD has now implemented on-line open houses in a format that can be accessed by computer and mobile device users at any time. We use an on-line tool that mimics a traditional open house with “stations” that visitors can visit. In addition, the tool allows users to provide real-time feedback and take surveys and polls as they go through the open house. This feedback, as well as analytics on open house attendance, are provided directly to WTD. The on-line meeting information can be saved as a future resource on the project website. We have seen an increase in participation in our community engagement through this tool.

The Technology Assessment and Innovation Program currently has two wastewater treatment pilot facility projects where real-time data can be shared with our partners via cloud-based platforms. The cloud-based data-management platforms will show real-time health of the pilot systems and will have trending and diagnostics capabilities. The apps can be accessed by PCs, tablets and smartphones.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

WTD understands that people receive information in many different ways and use a variety of forums to share activity and program details. The most convenient way for other utilities is likely through our website. Specific links include:

WTD Community Services Program:

<https://www.kingcounty.gov/depts/dnpr/wtd/capital-projects/project-phases.aspx>

WTD Education Program:

<https://www.kingcounty.gov/services/environment/wastewater/education.aspx>

Clean Water Ambassador Program:

<https://kingcountywtd.com/2018/09/07/2018-clean-water-ambassador-internship/>

RainWise Partnership with Seattle Public Utilities:

<https://www.kingcounty.gov/services/environment/wastewater/cso/rainwise.aspx>

WaterWorks Grants:

<https://www.kingcounty.gov/services/environment/grants-and-awards/waterworks.aspx>

WTD Social Media (can follow links from the page):

<https://www.kingcounty.gov/depts/dnpr/wtd/newsroom.aspx>

WTD/University of Washington Graduate Research Fellowship Program:

<https://www.kingcounty.gov/services/environment/wastewater/resource-recovery/Technology/Partnerships.aspx>

CitySoil Farm:

<https://www.kingcounty.gov/services/environment/wastewater/education/locations/south-plant/farm.aspx>

Clean Water Plan:

<https://www.kingcounty.gov/depts/dnpr/wtd/capital-projects/system-planning/clean-water-plan.aspx>

### Performance Measures & Results

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Community Services Program: Number of communications with individuals. Number of activities such as briefings, events, mailings, newsletters.	Ensure communities are included in early discussions about capital projects that may affect them and informed about project activities during construction.	In 2018, over 2,600 individual communications; over 380 activities such as briefings, events, mailings, newsletters.
Education Program: Number of school children and adults attending treatment plant tour.	Maximize opportunities to provide clean water education to schools, especially in districts with a high percentage of students on free and reduced lunch and students of color.	During the 2017-2018 school year: Reached over 17,500 school children and adults 62% of students identified as non-white 42% of students identified as low socio economic status
Clean Water Ambassador Program: Number of youth participating in Clean Water Ambassador program.	Teach Clean Water Ambassadors how to take action to protect clean water in our region and inform their peers and community about clean water issues, including healthy salmon streams and wastewater treatment.	48 Clean Water Ambassadors over five years.
RainWise Partnership: Number of rebates issued.	Maximize participation in RainWise program to reduce the	Since program inception in 2013, 805 rebates issued to manage rain

Number of outreach events held to promote program.	amount of stormwater entering WTD’s conveyance system.	that falls on over 27 acres of hard surface. In 2018, held 49 outreach events.
WaterWorks Grants: Number and dollar amount of grants awarded.	Provide funding for projects that improve water quality in WTD’s service area.	In 2018, the King County WaterWorks Grant program awarded over \$1.8 million for 23 projects that benefit water quality.
Social Media: Number of social media followers.	Deliver more effective outreach and engagement and solicit stakeholder participation.	Over 1,000 Twitter and 700 Facebook followers. May 2019 post reach was over 10,000.
UW Fellowship Program: Number of graduate students funded. Documentation of research process and results	Fund two graduate students in UW Civil and Environmental Engineering Department to conduct applied research.	In 2018, the fellowship funded two graduate students that: (1) conducted pilot testing of an aerobic granular sludge pilot facility for combined sewer overflow treatment, and (2) performed an assessment of digester foaming at WTD’s treatment plants.
CitySoil Farm: Pounds of produce donated to local food bank.	Educate people about the use of recycled water and biosolids, and demonstrate the potential for community food projects.	In 2017, 3,645 pounds of produce donated from WTD CitySoil Farm to the White Center Food Bank which supports the most diverse zip code in the United States.

# Knoxville Utilities Utility (KUB), TN

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: Knoxville Utilities Board		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Multiple Plants		
Service Area (square miles): 245 (for wastewater system)	Average Annual Daily Flow or Demand (MGD): 38.14 MGD	
Population Served: 70,265 wastewater customers		
<b>Location</b>		
Street Address: 445 South Gay Street		
City: Knoxville	State: TN	Country: USA
Zip Code/Country Code: 37902		
<b>Utility Representative Contact Information</b>		
Name: Billie Jo McCarley	Phone: (865) 558-2926	Email: BillieJo.McCarley@kub.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name: N/A	Title: N/A	Contact Information (phone or email): N/A

Current Program Members Only

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today?

2016

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>52</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>53</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>54</sup> ( \_\_ IGP)

## Application Part 2: Organizational Culture

KUB provides electric, natural gas, water, and wastewater services to over 461,000 customers in Knoxville and parts of seven surrounding counties. While KUB exists to provide utility services that are safe, reliable, and affordable, KUB's mission is about more than pipes and wires – it's about being good stewards of the environment and safeguarding our communities' resources for future generation.

KUB operates under a corporate Blueprint, which lays out our goals, shared values, measures of success, and keys to success across all departments. This Blueprint is ingrained in every process, program, and aspect of our organizational culture.

KUB lives out our mission of effectively serving our customers by shaping our workforce to reflect the community we serve. KUB supports the principle of equal opportunity in all personnel functions, including recruiting, employment, and training. Our Human Resources staff develops specific recruiting and selection plans for position vacancies to ensure diverse applicant pools are included. All KUB managers, supervisors, appraisers, foremen, and crew leaders receive regular training on KUB diversity and inclusion policies and expectations.

KUB is committed to building a workforce that is engaged and educated on aspects of the company beyond their own departments to foster a company culture in which all employees feel comfortable outside their day-to-day tasks. Employees are offered nine modules as part of KUB's Business Education Series (BES), during which attendees learn the ins and outs of company processes. Since KUB last submitted our Utility of the Future Today application in 2016, 99 employees have completed all sessions in the BES, with many more on their way to completion.

KUB is also invested in our employees' outside education. KUB pays up to 100% of educational tuition and fees (excluding books, entrance exams, and non-credit preparatory courses), up to \$25,000 for approved courses of undergraduate study, and up to \$17,000 for approved courses for graduate study.

KUB educates our employees internally through the Leadership Development Program (LDP), which was designed to broaden participants' understanding of KUB's business environment while providing resources to help them strengthen their leadership and professional skills. Since 2016, 53 employees have completed LDP, and 35 additional employees will graduate from the program in 2020.

<sup>52</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>53</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

In addition to LDP, KUB values recognizing current employees who have expressed interest in relocating to various departments in order to broaden their corporate perspective. Since KUB's last Utility of the Future Today (UOTF) application, KUB has selected 80 individuals through our vacancy process to receive new opportunities within the company, accounting for 23% of our total hires and placements being internal selections. In addition to these employee selections, all management positions since 2016 have been filled internally, with a total of 23 employee promotions into management positions.

As part of our Blueprint, KUB values the well-being of our employees. Programs that promote physical, emotional, and financial wellness have been implemented company-wide. Our Human Resources Department provides financial wellness courses and webinars, as well as an Employee Assistance Program that provides six free and confidential sessions with a licensed mental health professional per issue annually. KUB has also developed and implemented a successful physical wellness program called Healthy Habits. KUB's Occupational Health team contracts with an Industrial Athletic Trainer and a Registered Dietitian to provide ergonomic education through our Work Healthy ergonomics program and nutritional counseling. Our on-campus clinic provides services such as biometric screenings and flu vaccines.

Within the Blueprint, Safety Performance is a critical measure of success and shared value. Our Safety Department was established in 2004, and since then, our success has been proven through recorded metrics. Our Driving Safety and Work Healthy ergonomics programs have exceeded expectations, with preventable motor vehicle accidents recently reduced by 70% and strains and sprains reduced by 31%. We met our Fiscal Year 2018 target of less than four serious, preventable injuries, and we continue to collect input from our employees on how we can improve KUB's overall safety performance.

KUB is committed to participating in the communities we serve, exemplified in employee commitment through participation in corporate-wide initiatives, such as our Volunteer Time and TeenWork programs. Employees are invited to join KUB's Employee Association and KUB Cares organizations, both of which enable participation in activities that give back to charitable organizations, like the United Way and Salvation Army. KUB holds annual United Way donation campaigns, which are 100% employee funded and have contributed to our designation as a Champion Company, given to companies that have donated \$1 million or more over a five-year period.

Through our Volunteer Time program, employees are allotted eight hours of work time annually to volunteer for area organizations, including opportunities to clean up waterways and promote environmental education. Since KUB last applied for the UOTF designation in 2016, employees have provided nearly 11,000 volunteer hours to our community, as reflected in our annual Community Relations Report.

KUB has administered its TeenWork program for nearly 25 years, partnering with a local high school to provide opportunities for real-world job experience to high-performing students. Since the program began, 411 students have completed the program. Since 2008, 15 TeenWork participants have been hired as full time employees, and 10 of those employees are still working at KUB full time.

KUB is also committed to upholding our Blueprint mission of acting as good stewards of our communities' resources, which includes investing in our system infrastructure. As our nation continues to face the challenge of replacing aging infrastructure, KUB's Century II infrastructure management program is designed to be an investment in our next 100 years of quality service – and in the quality of life in our community. With long-range financial plans endorsed by KUB's Board of Commissioners, Century II ensures sustainable life-cycle replacement programs for all four utility systems.

In addition to serving as a steward of our communities' utility assets and customer dollars, our mission includes a focus on our environment. KUB has a strong legacy of environmental responsibility, participating in sustainability partnerships, and giving back to our communities. Some of KUB's most

important positive impacts on sustainability are the daily treatment of approximately 30 million gallons of wastewater, discharged to the Tennessee River, as well as KUB's source water protection efforts that focus on river and stream monitoring, compliance with our wastewater National Pollutant Discharge Elimination System (NPDES) permits, and prevention of SSOs. KUB's plants receive Peak Performance awards from the National Association of Clean Water Agencies (NACWA) each year for excellence in operations and compliance in meeting or exceeding regulations. However, KUB's sustainability efforts go well beyond compliance. Our Biosolids Beneficial Reuse Program, detailed in Application Part 3, has allowed KUB to avoid taking organic solids from the wastewater treatment process to the landfill for over 25 years.

KUB employees participate in environmentally-focused events in the communities we serve, including EarthFest, WaterFest, and River Rescue. Additionally, KUB is an EPA WaterSense partner and is active in providing customers with water conservation information. KUB is also a long-standing participant in an area Water Quality Forum, a cooperative network of agencies nonprofit organizations, and citizens who have worked for over 20 years to improve the health of waterways in East Tennessee in accordance with the goals of the Clean Water Act.

As part of our environmental commitment, KUB's fleet includes CNG, E85 (blend of 85% ethanol) flex fuel, electric, and hybrid vehicles. In January 2017, KUB opened a new CNG fueling station to the public, which is the first of its kind in Knoxville. KUB serves on the Board and as a Gold Sponsor for the East Tennessee Clean Fuels Coalition and is recognized by that organization as a Tennessee Green Fleet.

KUB's environmental efforts also include upgrading our facilities to conserve energy and promote sustainability. KUB has undertaken several energy saving initiatives at our plants, such as replacing lighting with LED bulbs, installing variable frequency drives to optimize pump run times, using fine air diffusers at our Kuwahee Wastewater Treatment Plant to produce more efficient dissolved oxygen transfer and decrease blower load, and use of turbo blowers to be more efficient in producing air. KUB's Engineering Department uses a checklist to ensure employees and contractors have considered sustainability opportunities on projects, such as renewable energy, energy efficiency, water quality and conservation, air quality, waste management and recycling, chemical minimization and environmentally preferred chemicals, and fuel efficiency.

### **Application Part 3: Activity Area – Beneficial Biosolids Use**

KUB's award-winning Biosolids Management Program allows for 100% beneficial reuse and prevents biosolids from being sent to landfills. KUB has ensured 100% beneficial reuse of its biosolids for over twenty-five years. Since 2011, the program has been certified at the Platinum level by the National Biosolids Partnership (NBP) and is one of only thirty –four nationwide and the only utility in Tennessee to achieve NBP certification. KUB utilizes industry best practices with rigorous quality control and a continuous improvement program to yield a product registered as fertilizer by the Tennessee Department of Agriculture. The program currently provides an average of 30,000 wet tons of biosolids to regional farmers at no cost, with a total estimated annual savings to the farmers of \$900,000 in fertilizer costs avoided, in addition to the environmental benefit of less chemicals applied to the land. KUB received an award from the Tennessee Water Environment Association for Tennessee's Beneficial Use of Biosolids in 2014. Further, KUB received an award from Water Environment Federation for Utility of the Future in the activity area of Beneficial Biosolids Use in 2016.

Since KUB last applied for the Utility of the Future Today recognition program, we have maintained an active relationship with the Knoxville community and have offered a vast amount of information on biosolids and KUB's Biosolids Beneficial Reuse Program. In an effort to optimize community involvement, understanding, and support of our Biosolids Beneficial Reuse Program, KUB participates in award opportunities to highlight the performance of our utility services. Our wastewater facilities are continuously recognized for their award-winning performance.

Since 2011, KUB has maintained Platinum status through the National Biosolids Partnership (NBP) and is the only utility in TN to achieve this status.

KUB participates in annual biosolids refresher training, which the Biosolids Coordinator facilitates for departments that have a vested interest in the program. This training covers the fundamentals of knowledge, as well as any new processes that have been implemented in the last year.

KUB's Biosolids Coordinator presents general information on biosolids and KUB's Biosolids Beneficial Reuse Program to local schools and at community events in the Knoxville area to provide current knowledge on the initiative and keep the public invested. KUB's public presentation frequency has increased by 150 percent in recent years.

KUB improved the biosolids webpage on KUB.org for customer information, use, and convenience to maintain satisfaction with interested parties in and around the Knoxville area. This has allowed the Knoxville community to have information readily available and has provided a solid foundation where questions can be asked and answered from a specialist in the field of biosolids.

KUB updated our Post-Biosolids Application Questionnaire to receive more quantitative data from farmers who benefit from KUB's biosolids in an effort to continuously improve the program. KUB's goal is to produce a quality biosolids product, while also maintaining strong and trustworthy relationships with the farmers who receive our Biosolids.

KUB has land applied 100% of our biosolids for over 25 years.

KUB sends an annual environmental report to the City of Knoxville, which includes a section on biosolids performance. In addition to this, KUB provides a newsletter and a biosolids brochure as a means of public communication.

KUB provides a Business Education Series employee course in which biosolids are discussed to help educate KUB employees on the Biosolids Beneficial Reuse Program. From this series, KUB employees are given the knowledge they need to properly educate anyone with questions concerning our product.

KUB's biosolids are Class B and certified as fertilizer by the Tennessee Department of Agriculture.

In 2018, KUB began a Biosolids Feasibility Study in order to evaluate our current program to ensure we can meet future regulatory and customer concerns. The study is expected to conclude in fall of 2019.

### **Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

KUB uses a management system approach to Biosolids to maintain regulatory compliance, environmental performance, quality practices, and relations with interested parties. This has allowed KUB to implement several processes pertaining to biosolids that can develop over time as the local need for biosolids management progresses. The Biosolids Coordinator is ultimately responsible for the management of the program. KUB utilizes the input of several departments around the organization to ensure that the proper standards, practices, and processes are being met and implemented. KUB has a state certified water quality laboratory facility that maintains involvement in the performance of our Biosolids Beneficial Reuse Program.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

KUB’s Biosolids Coordinator facilitates all implementation processes regarding our Biosolids Beneficial Reuse Program. It is that individual’s role to coordinate with other departments and set the budget for any new processes that are to be implemented.

The Biosolids Coordinator conducts management reviews to provide updates and gain input. The Management Review Team meets semi-annually and includes representatives from regulatory services, communications, KUB management, and KUB’s biosolids management contractor.

Did you partner with other stakeholders or organizations as a part of your implementation process?

KUB partnered with a biosolids management contractor as well as other biosolids producers across the state to help develop a successful program. Inclusion of local farmers that benefit from the program helped to direct the path of implementation and continues today through our proactive communication program.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

As with many biosolids programs in the country, a critical obstacle KUB faces is public perception and acceptance of biosolids. Community outreach and communication are vital to maintaining trust with the public and customers. As part of our program requirements, KUB is required to follow-up on any question or complaints within five working days. In addition, KUB engages in proactive communication, so concerns and questions are addressed on the front-end. As a result of KUB’s proactive approach to public communications and management of its biosolids, the program has not received a complaint since 2013.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Not applicable to KUB.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

KUB offers a website on our Biosolids Beneficial Reuse Program. The website contains FAQs and supplemental information on the National Biosolids Partnership, community outreach, and information for farmers who may be interested in receiving KUB’s biosolids. Individual questions can be answered directly by emailing biosolids@kub.org or by visiting <https://www.kub.org/about/environment/environmental-programs/biosolids-program/>.

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Fecal Coliform Levels	Goal is to maintain an average fecal coliform level of less than 200,000 (MPN). Regulatory limit is 2,000,000 (MPN).	Maintained average fecal coliform levels under 200,000 most probable number (MPN) in all reporting periods but one.
Beneficial Use and Land Application	Goal is to land apply 100% of Biosolids product produced at the Kuwahee facility.	KUB has land applied all biosolids since implementation of the program over 25 years ago. (30,000 wet tons annually)
National Biosolids Partnership Certification	Goal is to remain certified under NBP.	KUB has maintained Platinum level certification since 2011.

Internal and External Audits	Goal is to annually participate in internal and external audits to keep KUB's Biosolids Beneficial Reuse Program competitive.	KUB continues to participate in internal and external audits to maintain process improvements and prevent nonconformances in our Biosolids Beneficial Reuse Program.
Biosolids Customer and Community Satisfaction	Goal is to continuously make progress with our Biosolids Beneficial Reuse program based on customer and community needs.	KUB maintains an archive of community feedback and opportunities, and from that new processes are implemented to benefit local farmers, customers and the community.
Risk Management	Goal is to maintain a risk management program pertaining to biosolids management in which all possibilities are analyzed and prevented.	KUB participates in both internal and external audits to maintain preparation for risk management situations and to prevent major nonconformances. Utilized a third party consultant to evaluate the biosolids environment across the country to help develop plans for the future.

# LOTT Clean Water Alliance, WA

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: LOTT Clean Water Alliance		
Type: Regional wastewater treatment and reclaimed water systems (LOTT owns and operates joint facilities, including a large centralized wastewater treatment plant, two reclaimed water treatment plants, three major pump stations, sewer interceptor pipelines, reclaimed water conveyance pipelines, and a reclaimed water storage tank.)		
Service Area (square miles): 81.68 square miles	Average Annual Daily Flow or Demand (MGD): 13 MGD	
Population Served: 118,000		
<b>Location</b>		
Street Address: 500 Adams Street NE		
City: Olympia WA	State:	Country: United States
Zip Code/Country Code: 98501-6911		

Utility Representative Contact Information		
Name: Joanne Lind	Phone: 360-528-5772	Email: joannelind@lottcleanwater.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b>		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? <b>2016</b>		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.		
<input type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <input type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship ( <input type="checkbox"/> IGP)		

## Application Part 2: Organizational Culture

The LOTT Clean Water Alliance operates regional wastewater treatment and reclaimed water systems serving the urban area of north Thurston County, Washington. LOTT is governed by four government partners – the cities of Lacey, Olympia, and Tumwater, and Thurston County. LOTT’s mission is to preserve and protect public health and the environment by cleaning and restoring water resources for our community. LOTT takes that mission seriously and goes above and beyond to plan and prepare for the community’s future needs.

LOTT recently completed a strategic planning process that occurs only once each six year period. LOTT staff from across the organization and the Board of Directors were actively engaged in the process. The result was renewed commitment to organizational values, a clear set of performance metrics, and an internal work plan focusing on six key areas: human resources, knowledge management, IT management, capital planning, emergency preparedness, and emerging issues. This comprehensive planning effort helps ensure LOTT is well positioned to adapt to major changes in leadership, personnel, and regulatory requirements expected in coming years.

LOTT’s organizational culture is focused on cultivating excellence, innovation, knowledge sharing, continual learning, and dedication in our workforce. We have a reputation as a workplace of choice, in part because our staff work together with a sense of family that is well-known outside our organization. We are asked during interviews of potential employees “What is your favorite thing about working here?” The answer is almost always “the people!” LOTT employees express their appreciation of co-workers who are very dedicated and proud of the work they do to protect health and the environment, and who are always willing to stop, no matter how busy they are, and help another staff member or share their expertise.

## **Leadership and Staff Development**

LOTT uses a team-based approach throughout the organization to encourage employee engagement and innovation, allowing LOTT to leverage staff perspectives and expertise in our efforts at continual improvement. This approach also fosters open communication, clear accountability, and is an effective way to prevent, respond to, and resolve problems. The Senior Leadership Team models the team-based management approach, supported by several working committees that report directly to the team and focus on key initiatives, including human resources, environmental coordination, information technology, and capital planning. This approach ensures that management is fully aware of upcoming projects and issues and that input from staff across the organization can be incorporated.

Other examples of our cross-disciplinary teams include:

- The Capital Project Planning Process (CP3) team offers a forum for staff to bring forward ideas for capital projects to improve LOTT facilities or processes. The group includes staff from across the organization who vet and prioritize projects for implementation.
- The Pilot Projects team is another forum for staff to propose pilot testing of new treatment technology or specific types of equipment. The group's first pilot has been very successful – micro-aeration in the digesters has reduced H<sub>2</sub>S levels in the biogas before it is utilized in the cogeneration system.
- The Energy Conservation team sponsors the “Kill-a-Watt” program that rewards staff for their energy saving ideas.
- The Safety Committee receives and reviews staff suggestions and rewards staff for reporting potential hazards and recommended safety improvements
- LOTT is committed to staff and leadership development, with knowledge management and succession planning always in mind. Trainings, courses, conferences, certificates, and other learning opportunities are available for all employees. Through our Career Development Program, we identify organizational needs, such as gaps in technical expertise or succession plans for key positions, and then create custom programs to develop a staff member to fill the need. Development plans generally involve a combination of formal training classes, shadowing incumbent staff, and developing specific areas of expertise to fill a new position, a new function, or to succeed a retiring staff member.
- Development of new leaders within the Operations work group has been a focus over the last several years. As part of succession planning, we are creating four new Career Development Plans for Operations leadership positions to be filled in the next several years. Work to improve the quality and consistency of training for Operations apprentices is ongoing, and two new development programs have also been implemented. The Operator Advancement program incentivizes training and skills enhancement so that Operators can advance to higher levels of responsibility. The Operator Incentive program encourages staff to train as subject matter experts to better serve utility needs. All these efforts help LOTT to build new leaders from within and better prepare for the wave of retirements facing our industry in coming years.

## **Safety and Wellness**

LOTT's Wellness Program emphasizes health, fitness, and fun! Events like cooking demonstrations, salad bar lunches, and fitness challenges get staff engaged and build healthy habits. In 2018, over 83% of staff participated in wellness and LOTT has earned the Association of Washington Cities' WellCity award each year since 2010.

Our Safety Incentive Program rewards staff for participating in safety meetings, reporting observed hazards, and sharing safety news with others. We have a robust safety training schedule tailored to the needs of each work group. Security is an added new focus, with close coordination with City of Olympia staff to develop clear procedures and improve our response to security incidents. We added two in-house security positions, in addition to contracted security. Emergency preparedness was identified as the top

priority for our 2019-2024 work plan, and staff resources are being dedicated to further develop our program.

### **Responsible Environmental Resource Stewardship**

Permit compliance at both the Budd Inlet Treatment Plant and the Martin Way Reclaimed Water Plant was 100% in both 2017 and 2018. In 2018, LOTT received the 2017 Wastewater Treatment Plant Outstanding Performance award for the Budd Inlet Treatment Plant from the Department of Ecology. LOTT also received three 2017 Gold-Level Peak Performance Awards from the National Association of Clean Water Agencies for permit compliance at the Budd Inlet Treatment Plant, Budd Inlet Reclaimed Water Plant, and the Martin Way Reclaimed Water Plant. Our plant staff are committed to maximizing performance at our treatment facilities, and as a result, our discharge levels for total inorganic nitrogen and biochemical oxygen demand are routinely lower than required. We are also proud of our success in managing major storm events, such that LOTT has not had a combined sewer overflow for over ten years.

As part of our commitment to environmental stewardship, LOTT captures and reuses renewable resources from the wastewater treatment process, including Class A Reclaimed Water, Biosolids, and Biogas. Reclaimed Water is currently used for toilet flushing, process water in the treatment plant, irrigation at parks and streetscapes, and in a recreational water feature. It is also used for groundwater replenishment at a LOTT-owned facility and a facility owned by the cities of Lacey and Olympia. They recharge groundwater with reclaimed water as part of their potable water rights mitigation plan. In 2018, almost 14% of wastewater flows were treated to Class A standards and demand for reclaimed water reached a peak.

LOTT produces Class B biosolids at the Budd Inlet Treatment Plant. A contract with an agricultural consortium in eastern Washington uses 100% of LOTT biosolids for direct land application to agricultural lands. Methane and other biogas generated in the wastewater treatment process is used in LOTT's cogeneration system to produce both heat energy and electricity. The system produces electricity to serve the needs of LOTT's Regional Services Center, saving around \$150,000 per year. Heat from the system serves the Regional Services Center, buildings and processes within the treatment plant, and the neighboring Hands On Children's Museum.

LOTT's leadership recognizes the importance of active community engagement and education. The Board of Directors provides ongoing, strong support for LOTT's education program, which is centered on our WET Science Center: a free education center open to the public six days a week. It features interactive displays that teach visitors about wastewater treatment, reclaimed water, water conservation, and environmental stewardship. We also have a formal education program, partnering with all three local school districts to educate the next generation about the importance of clean water and clean water careers.

LOTT also engages community members through unique facilities and partnerships that provide multiple community benefits:

LOTT partnered with the City of Olympia, the Port of Olympia, and the Hands On Children's Museum to create a vibrant public open space in the East Bay Public Plaza. The plaza features the first and only recreational water feature in the state of Washington that is fed by Class A Reclaimed Water. This wading stream gives the public a unique opportunity to splash around in recycled water.

LOTT partnered with the City of Tumwater to co-locate a reclaimed water storage tank on a city park site. The storage tank is built into the hillside and literally serves as the foundation for the park, creating an overlook from the top of the tank into the Deschutes River Valley below.

### **Application Part 3: Activity Area - Partnering & Engagement**

Overview

LOTT has a strong commitment to public education and engagement, including:

LOTT's WET Science Center is a free education center with activities and exhibits for visitors of all ages to learn about the urban water cycle, connections between drinking water, wastewater, and stormwater, and how we can all help protect water resources. In 2018, the WET Science Center had over 20,000 visitors and was voted one of the top three museums in the South Sound region.

LOTT has a formal partnership with our three local school districts to each bring one grade level to the WET Center for field trips that are integrated into their science curriculum. During the 2017-2018 school year, over 4,000 students participated in LOTT's education program.

The East Bay Plaza, owned and operated by LOTT, features a wading stream and a demonstration wetland, both fed by Class A Reclaimed Water. The plaza stream provides a popular community amenity and an opportunity for the public to interact with reclaimed water.

The design process for the reclaimed water storage tank described above included multiple public meetings to identify opportunities to be a good neighbor and maximize community benefit. The end result is happy neighbors, a valued public open space, and a piece of essential infrastructure that literally blends in to the environment.

LOTT is conducting a multi-year study to address community questions about residual chemicals in water. The community is actively engaged through a Community Advisory Group and public events to share data and foster community conversations.

LOTT's website is a continual work in progress to ensure visitors can find up-to-date information about projects and programs. A separate WET Center website offers a schedule for education center activities. Our social media presence drives visitors to these web resources.

LOTT has a reputation as an active and constructive community partner. Examples include:

LOTT produces Class A Reclaimed Water to offset discharge of treated effluent to marine waters, but the reclaimed water is a valued resource for our partner city water utilities. We work closely with them to provide reliable supply that they, in turn, use to mitigate for potable water rights and/or augment supply for non-potable purposes.

LOTT partnered with Port of Olympia and City of Olympia in 2018-2019 to develop a Sea Level Rise Response Plan – a coordinated strategy for protecting downtown Olympia and the Port peninsula, home to the Budd Inlet Treatment Plant, from future flooding.

LOTT is currently working with the Squaxin Island Tribe to develop a collaborative strategy for future water quality and habitat improvement projects in the watershed.

LOTT often partners informally with industry peers to share information, host visiting groups, or visit other utilities. In 2018, LOTT visited Central Tacoma's Treatment Plant to view their perimeter flood wall, and LOTT hosted visits from King and Pierce County wastewater utility staff interested in nutrient removal technology.

LOTT partnered with the City of Olympia to help address public health concerns associated with human waste in public areas from a growing homeless population in downtown. LOTT funded two hygiene trailers for use at a City-managed homeless camp.

### **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Our Board of Directors, made up of one elected official from each of our four partner governments, have been champions of LOTT's education program, WET Science Center, and public engagement efforts. They feel that community members must learn to appreciate the importance of clean water and LOTT's role in protecting water quality, in order for us to sustain public support, generate necessary revenue, and effectively meet our mission.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Our WET Science Center exhibit design and construction, completed in 2010, cost about \$1.4 million. LOTT then budgeted \$80,000 per year for exhibit repairs and updates, and applied accrued funds to an exhibit update completed in 2016 for about \$300,000. The education program budget includes \$30,000 annually for school field trip support – bus transportation and substitute teachers. This is key to eliminating a barrier for our local school districts to participate in our programming. We have 3 staff members dedicated to the education program, and a modest volunteer program to help support peak visitor events. Other members of our communications team also support these efforts.

Did you partner with other stakeholders or organizations as a part of your implementation process?

For the education program, we partner with our three local school districts, their teachers, and their science curriculum staff. We also partner with local environmental educators – both public and non-profit to leverage their programming at our education center, which draws participants who may not otherwise visit us and learn about what LOTT does for the community. We partner with neighboring Hands On Children's Museum to coordinate and complement each other's programming.

LOTT partners with many other organizations as described above, including our four partner governments, their water, wastewater, and reclaimed water utility staff, the Port of Olympia, Squaxin Island Tribe, and industry peers. LOTT is also an active participant in a number of regional planning efforts, including a major effort to evaluate and determine the future management of Capitol Lake/Deschutes Estuary, a regional climate mitigation plan, and continued sea level rise response planning. We also annually host the environment-themed learning day for the local leadership development program Leadership Thurston County, sponsored by the Thurston County Chamber of Commerce.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

One of the obstacles we had to overcome was our own internal staff concerns about LOTT spending resources – time, money, and staffing – on efforts that were seemingly outside our main mission of treating wastewater. Why have a recreational water feature in a public open space that requires staff to maintain the filter system, monitor water quality, and staff a park-like area? It took time to explain to staff the benefits of providing such a unique opportunity for the public to splash and play in reclaimed water. Now our staff see hundreds of people playing in the stream on hot summer days and they understand that the public learning firsthand about the quality of reclaimed water translates into public support, and even enthusiasm, for our long-range plan to expand reclaimed water production and use to meet our future wastewater capacity needs.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

Smart information technology supports these efforts in that it is integral to our wastewater treatment and reclaimed water production systems, which are automated through a MAX system with many remote sensors and alarms to keep Operators notified and facilitate necessary process adjustments. For our partnership with the cities of Lacey and Olympia, they depend on reliable delivery of high quality reclaimed water to their water rights mitigation/groundwater recharge site. To support that, we have

access to their SCADA system so that we can adjust delivery of reclaimed water, ensuring that they are getting the quantities they need at peak infiltration season and/or suspending delivery if water quality/nitrogen levels exceed their preferred threshold for recharge.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Information about the education program and the WET Science Center can be found:

- WET Science Center
- Education Program
- Outreach Program

Details about some of the other projects and partnerships described here can be found:

- Reclaimed Water
- Sea Level Rise Planning
- East Bay Public Plaza
- Reclaimed Water Study

Information about LOTT’s Strategic Plan, including our organizational values, performance goals and metrics, and priority work plan activities can be found:

Strategic Plan

### Performance Measures & Results

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Track and report total WET Center visits per year	Total visitor numbers equal to or greater than 10% of ratepayer base	This was accomplished: Total visits = 20,342 Percent of ratepayer base = 18%
Track and report general WET Center visitor (walk-in) attendance	Walk-in visits of at least 400 per month on average	This was accomplished: Total walk-ins = 14,864 Average per month = 1,214
Track and report participation in tours of LOTT facilities	At least 500 general public tour attendees annually	This was accomplished: Tour participants = 703
Maintain formal partnerships with three local school districts to host student field trips as part of their science curriculum	Host field trips annually for at least one grade level from each of three local school districts	This was accomplished: North Thurston School District = 7 <sup>th</sup> /8 <sup>th</sup> grade, 1,794 students Olympia School District = 6 <sup>th</sup> grade, 842 students Tumwater School District = 5 <sup>th</sup> grade, 259 students
Implement proactive communication plans for every major project and for issues that have significant public impact	Develop and implement plans for all major projects/initiatives	<i>This was accomplished, including for:</i> Reclaimed Water Infiltration Study, Sea Level Rise Response planning, Washington Street Property Improvements
Continue to provide website access to a video record of LOTT Board meetings	Continue to provide web access to video recordings of Board meeting	This was accomplished: The meeting videos have been accessible from the web site since

		October 2016
Offer a variety of opportunities for gathering public feedback at any one time	Provide at least 3 opportunities annually, such as comment cards, phone inquiries, in-person chats, public meetings, website comment options, special events, etc.	This was accomplished: At least 4 opportunities were ongoing, others were special efforts. The Sea Level Rise planning effort included an on-line survey and multiple public workshops
Meet with utility or industry peers to share ideas, experiences, and expertise as appropriate	Meet with at least 2 industry peers	This was accomplished: Peer meetings = 18

# NEW Water, the brand of the Green Bay Metropolitan Sewerage District, WI

## Watershed Stewardship



### Application Part 1: Background Information

Utility Name: NEW Water, the brand of the Green Bay Metropolitan Sewerage District		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional System		
Service Area (square miles): 285	Average Annual Daily Flow or Demand (MGD): 38	
Population Served: 233,000		
<b>Location</b>		
Street Address: 2231 North Quincy Street		
City: Green Bay	State: Wisconsin	Country: United States
Zip Code/Country Code: 54302		
<b>Utility Representative Contact Information</b>		
Name: Thomas W Sigmund	Phone: 920-438-1095	Email: tsigmund@newwater.us
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

Current Program Members Only

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today? 2016

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>55</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>56</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>57</sup> ( IGP)

## Application Part 2: Organizational Culture

NEW Water’s approach to delivering clean water reflects the concepts identified in the Utility of the Future. NEW Water incorporated those concepts into its recently updated Strategic Plan, and they drive much of the Utility’s day-to-day operations.

In 2016 NEW Water defined and implemented a set of unified organizational cultural attributes:

**Safety** is our most important value

We **Respect** and value diverse individuals and values

One **Team** that communicates openly and honestly while encouraging and supporting one another in achieving common goals

Leaders in the **Environment** always looking beyond compliance.

NEW Water leadership emphasizes the cultural attributes when communicating with staff. Activities to engage employees through culture promotion are ongoing.

A number of cross-functional committees promote our **Team** attribute and enhance employee engagement. A total of 84 NEW Water employees are active participants in the following committees: Committee for Appreciation and Recognition of Employees (CARE), Safety, Billing, Energy and Sustainability, Lean Steering, Wellness, and Management Team.

NEW Water supports an active wellness program with 90 percent employee participation in 2018. This program promotes health and wellness as an integral component of safety and well-being, both in the workplace and at home.

NEW Water attracts, develops, and retains a high performing workforce as evidenced by:

Promotion of seven employees to leadership positions in 2017 and 2018. Leader assessments, such as Strengths Finders, and leader development opportunities are provided on a regular basis to prepare high performing employees for advancement.

<sup>55</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>56</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>57</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

On-the-job training provides operational knowledge needed to progress through the three-year Operator-in-Training program to advance to Operator status.

Three employees were actively employed in state certified apprenticeship programs in the Maintenance Mechanic and Electrical & Instrumentation trades in 2018.

Five employees were financially supported in their pursuit of a Bachelor’s or Master’s degree in 2018.

Six employees since 2017 have participated in the Utility Leaders of the Future training program. This leadership training assists in succession planning efforts by identifying high potential employees for future leadership positions.

Eight college level interns and two youth apprentices from area high schools were employed in 2018. These programs provide an opportunity to build relationships with future job candidates and prepare them to become competent members of the workforce.

NEW Water provides a structured New Employee Orientation Program, which helps employees build a foundation of knowledge about NEW Water’s mission, goals, policies, safety, organization structure, and functions.

NEW Water believes that a strong safety culture is a key part of enterprise resiliency. The organization has an active Safety Committee and conducts monthly mandatory safety awareness training for all employees. All employees completed 100% of the training modules in 2018.

NEW Water regularly monitors safety metrics including recognized hazards and near misses, which are leading indicators of safety.

Year	Total Hours Worked	Recordable Incident Rate (RIR)	Industry Average (RIR)	Recognized Hazards Reported	Near Misses Reported
2018	192,816	5.2	Not Available	500	12
2017	185,840	1.1	2.6	226	23
2016	185,580	3.2	3.8	90	27

NEW Water worked with its Commission, staff, and stakeholders in 2019 to develop an updated strategic plan. The plan supports the utility’s vision “Protecting our most valuable resource, water”. The plan sets out a strategic investment portfolio for the next three years focused on:

Community Outreach – engaging stakeholders to support advancement of NEW Water’s mission

Innovation – exploring emerging technologies and practices to enhance the delivery of NEW Water’s services

Team – attracting, developing, and retaining a high performing team

Organizational Optimization – ensuring operational efficiencies through continuous improvement, asset management, capital improvement planning, and risk management

Water Quality Improvements – making a positive impact on sources of water entering the Bay

NEW Water’s leadership participates in several peer-utility based initiatives sponsored by EPA, WEF, NACWA, and others that include:

Effective Utility Management (EUM)

Water Resources Utility of the Future (UOTF)

Active participant in NACWA's Engage network

Member of the Water Research Foundation

Member of Southeastern Wisconsin based Water Equipment and Policy Industry/University Cooperative Research Center with universities, industry and clean water utilities focused on water research

In anticipation of the changes needed to transform the utility to better meet future needs, the Green Bay Metropolitan Sewerage District orchestrated and implemented a rebranding of the utility in 2012 starting with the name, NEW Water, which provided a platform to introduce significant changes in the way the utility functioned, both internally and externally. This rebranding process launched a new era for the public perception of NEW Water as well, as the utility strives to collaborate as a partner and leader, working for a more sustainable community.

NEW Water's leadership works to communicate effectively with its employees. Quarterly employee briefings are held to communicate topics of interest to employees in a timely manner. NEW Water has a monthly employee newsletter called the Metroflow, which provides updates on projects, employee social events, and community events.

Beginning in 2003, NEW Water committed itself to operational excellence by achieving 100 percent compliance with all aspects of its discharge permit and has maintained that level of excellence through 2018. Using that performance as a base, staff have ventured into other areas, such as risk based asset and non-asset management, employee leadership development, customer and stakeholder communication, resource recovery, and leading efforts in the watershed with a wide variety of stakeholders to make even greater improvements in regional water quality and habitat restoration.

In partnership with NEW Water, Brown County established the Household Hazardous Waste program in 1996. Since then, NEW Water has provided significant annual financial support to the program on behalf of its municipal customers so residents in the service area can take unwanted hazardous materials to the site for safe disposal, keeping them out of the sewer system. In 2018 the Household Hazardous Waste program collected 248 pounds of elemental mercury and mercury devices, ensuring that the waste was properly disposed of. NEW Water's engagement with this program also helps satisfy the mercury variance in its WPDES permit.

NEW Water works with local media, social media, its website, and its customers to provide the community with information on water quality related issues. NEW Water collaborates with partners on pollution prevention messaging to protect area waterways.

NEW Water is active in building community support for improved water quality in the Fox River and Green Bay through an aggressive communication and outreach program. NEW Water owns the Jack Day Environmental Education Center, which is located on the banks of the Fox River at the mouth of Green Bay. Regular water quality meetings and media events are conducted at the Jack Day Center, including the World Water Day celebration and an annual "STEM Superheroes" children's summer camp, which engages at-risk youth to learn important skill sets needed for careers in water in a fun and engaging way.

### **Application Part 3: Activity Area - Watershed Stewardship**

#### Overview

One third of all nutrients entering Lake Michigan come from the Fox River. NEW Water's two water resource recovery facilities (WRF) discharge to the Fox River and contribute about 2.5% of the total annual phosphorus entering Green Bay. The utility is committed to reducing phosphorus loading on a watershed scale. NEW Water identified several years ago that spending over \$150 million to upgrade its two WRFs to remove incremental amounts of phosphorus from its effluent was an inefficient use of limited customer resources. NEW Water has available from the Wisconsin Department of Natural

Resources an alternative compliance method called Adaptive Management where point sources can work with nonpoint sources (urban or rural storm water) to achieve equal or greater reduction of phosphorus in the watershed than is required by permit at the WRFs, presumably at a lower cost than improvements at the WRFs.

NEW Water has an Aquatic Monitoring Program that has been in place for 33 years monitoring the health of rivers and the bay of Green Bay. In 2018, 459 water quality samples were collected producing 6,000 results. NEW Water partners with UW Green Bay, US Fish and Wildlife Service, US Geological Survey, and the UW Milwaukee School of Freshwater Sciences to collect and evaluate water quality data that has led to discovery of a hypoxic zone in the bay of Green Bay.

NEW Water has an umbrella permit for phosphorus and suspended solids since both the De Pere and Green Bay Facilities discharge into the Fox River about seven miles apart prior to entering the bay of Green Bay. This permit allows the discharge from both facilities to be managed as a single discharge.

In 2014, NEW Water began the Silver Creek Pilot Adaptive Management Project in a 4,800 acre watershed in the Lower Fox River Basin to gain experience in Adaptive Management prior to committing to a 20-year full-scale permit compliance program. The Silver Creek Adaptive Management Project is being done in partnership with the Oneida Tribe of Indians, the US Natural Resources Conservation Service (NRCS), WDNR, Brown and Outagamie County Governments, US Fish and Wildlife Service, USGS, UW Green Bay, The Nature Conservancy, and Ducks Unlimited. The five-year pilot project has improved water quality by reducing agriculture nonpoint pollution and evaluated best management practices (BMPs) for transfer to a larger watershed. Water quality monitoring is being conducted by USGS and NEW Water. Water quality modeling is also done to evaluate conditions before and after implementation of conservation projects.

In 2018 NEW Water began a 20-year Adaptive Management Program in the 38,000 acre Dutchman and Ashwaubenon Creek watersheds in the Lower Fox River Basin. NEW Water is utilizing the partnerships developed in the pilot project, as well as implementing similar agricultural BMPs. Adaptive Management with agricultural producers has proven to be a better value for its customers and will have greater water quality benefits than expanding treatment facilities.

### **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

NEW Water applied for and received a \$1.7 million Great Lakes Restoration Initiative grant to implement Adaptive Management practices in a pilot project in the 4,800 acre Silver Creek sub-watershed. Since our core business is not working with agricultural practices and farmers, NEW Water realized it needed to gain experience to see if it could be successful in this new venture.

NEW Water partnered with a large group of stakeholders (see the answer to c. below) and used Jacobs Engineering to help implement the project. In addition to involving staff from the two county land and water conservation departments, directly involving two crop consultants who had long-standing relationships directly with the farmers in the area. NEW Water staff believe the crop consultants enabled the success of the pilot project as trust relationships with farmers takes time, more than we had available.

The Silver Creek Adaptive Management Project was designed to see if NEW Water could administer this complex process and cost-effectively affect positive water quality and habitat improvements through improvements in land use and cropping practices. This work was done at a pilot scale because in late 2018 NEW Water had to decide if it wanted to continue this initiative at a larger watershed scale over the next 20 years, or if it wanted to construct phosphorus removal facilities at its treatment facilities.

NEW Water's watershed partners helped develop the approach to working with farmers and the suite of BMPs to be implemented on the various agricultural fields in the watershed. A wetlands group was established to engage the partners who wanted to fund and implement wetland restoration projects.

Results from the pilot project showed that Adaptive Management greatly increased the number of stakeholders engaged in watershed activities and brought a higher level of discussion and action on understanding and improving how we live in the watershed and its impacts on water quality. NEW Water sees its efforts, while undertaken initially to find a cost-effective solution for its customers to a regulatory requirement, as a catalyst for community dialogue and action.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

NEW Water used two staff to support the pilot project and added 1.5 FTE staff from Outagamie and Brown County Land and Water Conservation. The GLRI grant supported some of the efforts, the Natural Resource and Conservation Service (NRCS) funded implementation of some practices, private groups funded wetlands restoration, and NEW Water supplemented the rest from its annual budget. About \$1 million was spent each year on the pilot project.

As NEW Water moves to a larger watershed (38,000 acres) it expects to spend about \$2.0 million per year to implement the full-scale program over a 20-year period. NEW Water will continue to seek grants to fund implementation of projects in the watershed.

Did you partner with other stakeholders or organizations as a part of your implementation process?

The list of stakeholders on this project is very long. Partnering with a very large and diverse group of stakeholders was critical to the success of this project. Partners are: Outagamie County Land and Water Conservation, Oneida Tribe of Indians, Tilth Agronomy, AgVentures, US Fish & Wildlife Service, Brown County Land and Water Conservation, United States EPA, University of Wisconsin Green Bay, The Nature Conservancy, Wisconsin Department of Natural Resources, United States Geological Survey, NRCS, Ducks Unlimited, the Fund for Lake Michigan, Jacobs, and McMahon.

NEW Water is also providing financial support to the Farm Network Demonstration Project in Brown County, which includes partnerships with growers, NRCS, county government, and USGS, to evaluate conservation practice installation effectiveness through edge-of-field monitoring.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Strong relationships with landowners and operators (farmers) is essential to understanding the farmers unique situations and working with the farmers to make changes to practices that, at times, have been passed down from generations.

In order to hold onto the water quality improvements generated by implementation of the BMPs, NEW Water proposed introducing permanency to the practices once implemented by requiring that maintenance of the practices be incorporated into the deed for the land. With appropriate financial incentives the team was able to obtain that permanency with deed restrictions in cost-share agreements.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

Yes, examples include:

The project team used drones to collect information and monitor implementation and maintenance of agricultural practices.

Tablet GIS systems were developed to enter field information as the technician was on the field, organize that data, and be able to review the information with the farmer.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

See NEW Water’s website for reports on the project at [www.newwater.us](http://www.newwater.us)

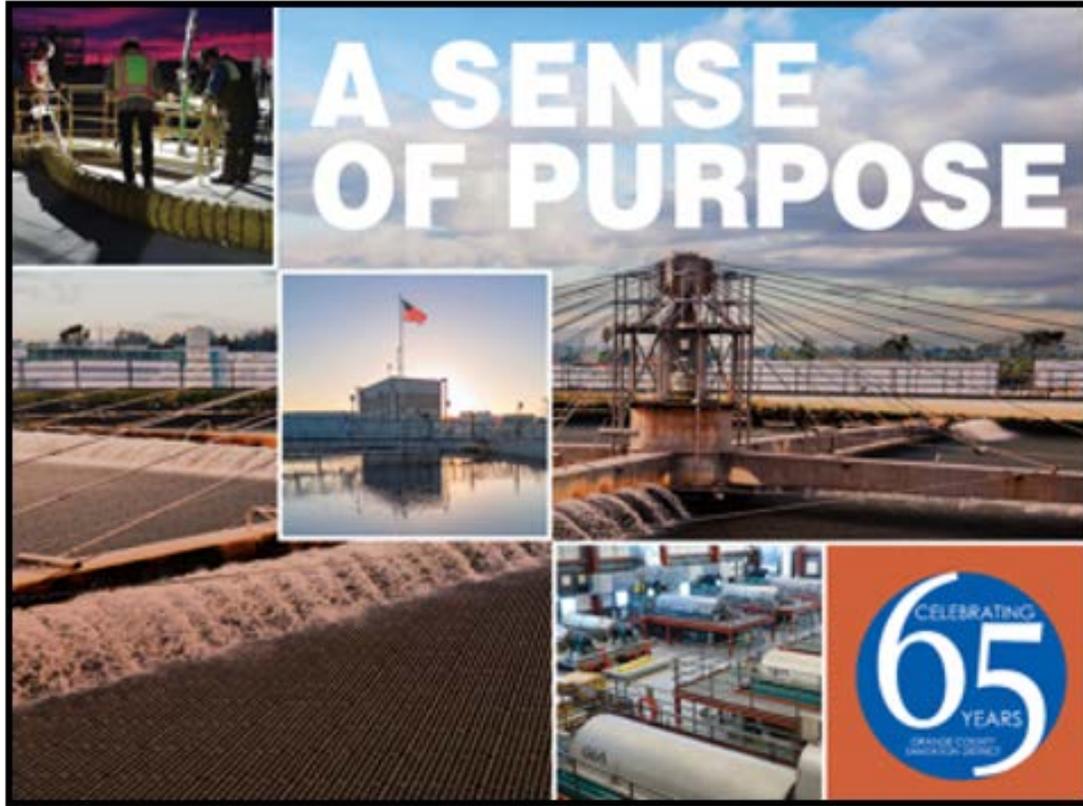
### Performance Measures & Results

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Maintenance policies that enable green infrastructure maintenance	Developed cost share agreements that will require sustainable permanent conservation practices by attaching the cost share agreement with maintenance requirements to landowner’s deed	13 cost share agreements completed with farmer landowners for installation of permanent conservation practices.
Workforce capable of evaluating and maintaining effective green infrastructure	Developed agreements with Outagamie County Land and Water Conservation Department and, Brown County Land and Water Conservation Department, and staffing contributions from Oneida Tribe of Indians to implement nonpoint conservation practices	1 FTE staff from Outagamie County and, 0.3 FTE staff from Brown County trained and dedicated to implementation of the project
Evaluation of water quality of Fox River and Green Bay	Data collected and analyzed by NEW Water in collaboration with the University of Wisconsin Green Bay	In 2018 collected 459 water samples producing 6000 analytical results
Phosphorus reduction from cropland due to BMP implementation	0.801 lb/acre	>1.5 – 2.0 lb/acre
Acres under Nutrient Management Plans	Development of Nutrient Management Plans on participating agricultural lands.	>1,500 acres
Percentage of agriculture acres with a cover crop over winter	>50%	85%
Wetland Restoration	Restoration of 20 acres of wetlands.	Restored 7 wetland basins that encompass, 45 wetland acres and , 150 total acres of wetland complex
Contracts for installation of annual conservation practices on agricultural lands. Operational BMP Contracts	Develop cost share agreements that will encourage usage of cover crops and no-till farming practices	20 cost share agreements completed with farmers for installation of cover crop and no-till conservation practices.
Acres converted to continuous cover.	Reduce sediment and associated phosphorus on approximately 50 currently tilled acres by	Converted 100 acres of conventionally tilled land into a managed grazing operation and

	transitioning to a continuous cover agricultural system (managed intensive grazing).	provided technical assistance to the grazer.
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# Orange County Sanitation District (OCSD), CA

## Watershed Stewardship



### Application Part 1: Background Information

Utility Name: Orange County Sanitation District (OCSD)		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): OCSD owns and operates a regional wastewater/dry weather urban runoff collection system, one wastewater treatment plant, and one reclamation plant		
Service Area (square miles): 471	Average Annual Daily Flow or Demand (MGD): 185	
Population Served: 2.6 million		
<b>Location</b>		
Street Address: 10844 Ellis Avenue		
City: Fountain Valley	State: CA	Country: United States of America
Zip Code/Country Code: 92708		
<b>Utility Representative Contact Information</b>		
Name: Jennifer Cabral	Phone: 714.593.7581	Email: jcabral@ocsd.com

If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below

Name:	Title:	Contact Information (phone or email):
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Current Program Members Only  
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today?  
2016

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>58</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>59</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>60</sup> ( \_\_IGP)

## Application Part 2: Organizational Culture

In 2016, the Orange County Sanitation District (OCSD) was recognized as a Utility of the Future Today for its efforts in Beneficial Biosolids Reuse, Community Partnering and Engagement, Energy Generation and Recovery, and Water Reuse. OCSD continues to strive in each of these areas while looking for opportunities in Energy Efficiency and Watershed Stewardship. For example, at the time of the 2016 application our Beneficial Biosolids Reuse was at 94 percent; in 2018 Biosolid Reuse reached 100 percent. Community Partnering and Engagement has increased in several areas including a 58 percent increase in speaking engagements, a 39 percent increase in public tours, and an 81 percent increase in social media posts.

The Orange County Sanitation District (OCSD) is a public agency that provides wastewater collection, treatment, and recycling for approximately 2.6 million people in central and northwest Orange County, California. It is a special district governed by a 25-member Board of Directors comprised of 20 cities, four special districts, and one representative from the Orange County Board of Supervisors. OCSD maintains 396 miles of regional pipeline, 15 pump stations, and operates two facilities: one in Fountain Valley that treats and recycles wastewater; and one in Huntington Beach that treats wastewater before releasing it into the Pacific Ocean.

The mission statement of OCSD is, “To protect public health and the environment by providing effective wastewater collection, treatment, and recycling.” These words have cultivated a sense of pride that extends beyond the confines of our campus walls and into each community that we serve. Our mission is the basis of the organizational culture at OCSD.

New employees are introduced to the OCSD organizational culture from the very beginning. In 2016, a New Employee Onboarding program was created. This program provides staff with an opportunity to

<sup>58</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>59</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>60</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

become familiarized with each of the six departments via modules hosted by a department representative. The program provides current staff with a unique opportunity to share what their group does for the organization, and it provides new staff with the opportunity to learn about how the larger organization operates.

Opportunities for peer-to-peer and cohort-based learning does not end after the onboarding program. OCSD sponsors a Mentoring Program that currently boasts 99 successful pairings; and a Job Shadowing Program that has had 211 pairs. Job Shadowing provides more experienced employees with a means to share their knowledge with entry level staff. This ensures that the “tribal” knowledge of our older staff is not lost when they retire. Additionally, formal leadership education is available for staff. In Fiscal Year 2017/18, 198 employees completed the Supervisor Transition and Readiness Training (S.T.A.R.T.) Program and 33 completed the California State University, Fullerton Leadership Development Program. Since 2016, 223 internal candidates have been promoted compared to 155 external candidate hires; a promotion rate of approximately 60 percent.

During Fiscal Year 2017/18, 20 educational opportunities were presented on-site with 968 seats filled, or 65 percent of all staff participating. On-site education covers a wide variety of topics including soft skills and technical training. Additionally, some are presented by staff. The staff presentations include topics such as our Organizational Awareness series which includes topics such as OCSD’s Master Plan, Asset Management or OCSD’s New Headquarters Complex, or the Coffee with the GM, which is an opportunity for a Q&A between the General Manager and staff. Presentations made by staff create a unique learning opportunity for all. For those who are presenting, it is a chance to shine a spotlight on the daily activities of their work group. Often the employees who are presenting are stepping out of their comfort zone by engaging in public speaking; but they are always able to do so successfully because they have such a sense of pride for their work. Post-presentation surveys tend to show the highest levels of feedback for staff-based presentation when compared to those done by professional presenters.

Staff contribution to OCSD is not limited to educational presentations. OCSD has an “Incentives for District Employees Achievements” (IDEA) Program that reviews staff submissions that offer solutions for enhancing or improving OCSD’s procedures on working conditions or work methods. In addition to a monetary incentive for successful IDEAs (amount based on cost savings to the OCSD), staff can say with pride that “this” was their idea. IDEA contributions are made by every level of the organization. Additionally, OCSD has a regular Project Clearinghouse meeting that provides staff with an opportunity to weigh in on new processes, innovations, and designs before the project begins.

OCSD is a teaching organization. Internships are available for students in both vocational and academic programs. Vocational interns are provided the opportunity to work in multiple areas of OCSD during their 52-week program. Academic interns work in areas matched to their educational pursuits for up to a two-year period. Approximately 56 percent of vocational and 34 percent of academic interns become full-time OCSD employees.

Safety is a priority for all at OCSD and is part of our organizational culture. We have a dedicated Safety Awareness Program that ensures not only everyone is working safely, but also that safety is on everyone’s radar. Each meeting begins with a safety moment that is presented by a staff member on a safety topic of their choosing. OCSD is also proud to have an in-house Medical Response Team. This is a group of volunteer staff members who have received advanced medical training and will provide immediate response to a situation prior to the arrival of emergency responders.

Southern California is densely populated. OCSD strives to be a good neighbor to the residents and businesses that surround our treatment facilities and collections system. To do this, we engage in a variety of outreach programs. Our Huntington Beach facility is undergoing improvements as part of the agency’s \$2.6 billion capital improvement program. This will result in a great deal of construction which can be very frustrating to those who live near it. The Plant No. 2 Neighborhood Outreach Program has allowed

us to engage nearby residents and build strong relationships. Recently, major trunkline construction has been taking place in the city of Anaheim. The Community Outreach Program created a project specific plan for this area to establish relationships with the impacted community and to educate them on our efforts prior to starting construction.

OCSD offers one-and-a-half-hour facility tours of Plant No. 1 in Fountain Valley. The tour program allows us to promote OCSD as a resource recovery agency and helps to educate the community about what we do and promote careers in the wastewater industry. OCSD recognizes that not everyone can come to our facilities, so staff regularly goes out into the community. We attend local community events and provide presentations at a variety of locations, including schools, professional associations, and neighborhood groups. Through distribution of brochures and one-on-one conversations, we can inform people about wastewater treatment in their community.

Measure	Target	Outcome
In-House Training Sessions Attended	70% of staff	FY16/17 79% of staff FY17/18 65% of staff
Leadership Training Sessions	S.T.A.R.T – 25/session CSUF Leadership Academy – 6/session	S.T.A.R.T Program 198 attendees CSUF Leadership Academy 33 attendees
Employee Engagement Survey	40-45% Response	FY16/17 – 62% FY17/18 – 77%

### Application Part 3: Activity Area - Watershed Stewardship

OCSD is known as a resource recovery agency as we work to reuse all aspects of the wastewater treatment process including biosolids, water, and energy. This is possible as a result of our proactive approach to Partnering and Engagement. Protecting the environment is a key tenant of our organizational mission, which means that we look for ways to diversify our efforts. Watershed stewardship at OCSD is accomplished through the capture of all in-plant stormwater, collaboration with Orange County Public Works to manage dry-weather urban runoff, and a partnership with the Orange County Water District.

OCSD facilities were designed so that all storm drains within the treatment plants, drain back into the treatment system. This means that since 1954, we have been collecting and treating every drop of water that falls within the boundaries of our two 110-acre facilities.

Traditionally, the stormwater system and the sewer system are separate. This means that the wastewater gets treated before it is discharged, and stormwater and urban runoff reach receiving waters without prior treatment.

Investigation into the 1999 Orange County beach closures in Huntington Beach suggested that the high bacteria levels that caused the beach closures came from dry weather urban runoff. As a partner in maintaining Orange County’s coastal resources, OCSD began accepting urban runoff into the system, thus establishing the Urban Runoff Program. In June 2002, Assembly Bill 1892 amended OCSD’s charter to formally allow the diversion and management of dry weather urban runoff flows. Today, OCSD receives dry weather urban runoff from 21 diversions located in four different Orange County watersheds: Anaheim Bay/Huntington Harbor, Santa Ana River, Newport Bay, and Newport Coastal. Averaging just under 400 million gallons annually during the past five years, OCSD has treated 9.6 billion gallons of dry weather urban runoff since 1999. With the passage of OCSD’s current policy, Resolution No. 13-09, the volume of dry weather urban runoff accepted for treatment without charge increased from 4 million gallons per day (MGD) to 10 MGD.

In 2008, OCSD and Orange County Water District (OCWD) began making drinking water of the future with the Groundwater Replenishment System (GWRS) the largest indirect potable reuse project of its kind. The GWRS takes highly treated wastewater from OCSD and treats it to near drinking water quality. GWRS is the ultimate expression of OCSD and OCWD’s long-term goal of developing a dependable

water supply from a resource that formerly was wasted to the ocean. In June 2015, the project was expanded to produce 100 million gallons of high-quality water per day, which is enough water for 850,000 residents annually. OCSD and OCWD are working to meet the future demand of GWRS through the GWRS Final Expansion project which will produce the equivalent of one year's water supply for over one million people. In 2018, GWRS received a Guinness World Record for the most water recycled to drinking water standards in a 24-hour period. Through this collaboration, the GWRS emerged as one of the most celebrated civil engineering and water reuse projects in the world.

How did you go about implementing the practices/activities/programs that you describe in your Overview Paragraph?

**Dry Weather Urban Runoff (DWURO):** For some time, storm water and urban runoff pollution have negatively impacted Orange County's beaches. As a result, the Santa Ana Regional Water Quality Control Board took direct action to control discharge of pollutants to tributaries and recreational bodies of water in Orange County by issuing a storm water permit to the county and cities. In 2000, OCSD's Board of Directors adopted OCSD's first resolution to help remediate the public health and environmental problems associated with urban runoff. Initially, the policy established a threshold discharge limit of 4 million gallons a day (MGD) without charge. In 2013, to address the problem of excessive selenium loading in the upper Newport Bay Watershed, the Board increased the volume to 10 MGD without charge for permitted flows. OCSD continues to work closely with Orange County Watersheds, the lead agency that coordinates the cities' efforts in implementing the Water Quality Management Plan required by the County of Orange's National Pollutant Discharge Elimination System (NPDES) permit. Before a diversion is implemented, the proposed project is presented to Orange County Watersheds' Technical Advisory Committee. The committee evaluates the proposal, and if approved, puts the diversion on the Dry Weather Diversion Priority List. This approval step ensures that the program's limited capacity is effectively utilized to improve coastal water quality.

**Groundwater Replenishment System (GWRS):** In the mid-1990s, OCSD and OCWD were facing capacity challenges. OCSD needed to build a second ocean outfall and OCWD needed to expand Water Factory No. 21 to address seawater intrusion into the groundwater system. GWRS came online in 2008 and was expanded from 70 million gallons per day to 100 million gallons per day in June 2015. Cost of construction for the GWRS facility was split between both agencies. OCSD built a new pump station to divert flow from Plant No. 2 in Huntington Beach to Plant No.1 in Fountain Valley. This increased the availability of secondary treated water for the GWRS and decreased the flow of treated water released through the ocean outfall, thus eliminating the need for a second pipeline. Today, GWRS produces 100 MGD, or enough water to supply 850,000 people with fresh water annually. At final expansion (2023), OCSD will recycle 100 percent of all reclaimable wastewater flow resulting in 130 MGD of quality water or the equivalent of a one-year water supply for over one million people.

What type and amount of resources were needed to support implementation?

**DWURO:** The Dry Weather Urban Runoff Program is administered by OCSD's Resource Protection Division, which issues a discharge permit for each of the diversion structures. The permit functions as a control mechanism that specifically prohibits storm runoff and authorizes discharge only during periods of dry weather. The permit also establishes specific discharge limits, constituent monitoring, and flow metering requirements. In addition, OCSD conducts quarterly sampling and analysis of the urban runoff discharges to ensure discharge limit compliance with the various regulated constituents.

**GWRS:** OCSD and OCWD shared the cost of constructing the first phase of the GWRS (\$481 million). OCWD funded the initial expansion of Water Factory No. 21 which cost \$142 million. OCSD supplied OCWD with stringently controlled, secondary treated wastewater at no charge.

Did you partner with other stakeholders or organizations as a part of your implementation process?

**DWURO:** Yes. Santa Ana Regional Quality Control Board, Orange County Public Works, Huntington Beach, Newport Beach, Irvine Ranch Water District, and PH Finance (owner of the Pelican Hill Resort).

**GWRS:** Yes. Orange County Water District

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

**DWURO:** While most cities continue to send their urban runoff to the ocean without treatment, OCSD created and implemented a program to allow the runoff to be diverted to its treatment facility before it reached receiving waters. Although the treatment plant infrastructure and capacity (during dry weather) were available, a special piece of legislation had to be created in order to allow the implementation of the Urban Runoff Diversion Program. In 2002, Assembly Bill 1892 amended OCSD's charter to formally allow the diversion and management of dry weather urban runoff flows. Specifically, the bill supplemented OCSD's existing powers to allow the following:

- 1) Diversion of urban runoff from drainage courses within OCSD's service area;
- 2) Treatment of the urban runoff;
- 3) Return of the water to the drainage courses; and
- 4) Beneficial use of the water.

**GWRS:** The GWRS is a project of perception. As a public agency, OCSD strives to be transparent in all its activities. "Toilet to Tap" is not a concept that is readily embraced by the public. To create understanding and acceptance of the program, OCSD and OCWD partnered to educate the public through outreach at community events and tours.

Legislation was utilized to allow those who were unable to tour the GWRS facility would be able to sample the water. Assembly Bill 2022 by Assemblyman Gordon was passed in 2016 and became law in 2017. The bill allows the limited bottling of advanced purified product water for educational purposes. OCWD and OCSD were the first in the Western Hemisphere to bottle recycled water.

Beginning in March of 2017, OCSD and OCWD took bottles of GWRS purified water on a year-long tour in California to share information about water reuse and to provide a taste to audiences who would otherwise not have the opportunity to try it. We took 13,000 bottles on the road to various events from San Diego to Sacramento, handed them out with literature, and answered questions from about 17,000 people.

OCSD and OCWD also challenged social media influencers and the media to #GetOverIt and take a taste test, which these groups promoted. The agencies created these campaigns to help overcome "toilet-to-tap" misconceptions and gain support of water reuse for future infrastructure and program investments on the public's behalf.

At the tour's end in February of 2018, and in celebration of its 10th anniversary, the GWRS set the Guinness World Records™ title for the Most Wastewater Recycled in 24 Hours.

Has "smart" information technology supported your implementation/optimization in this area?

**DWURO:** Most of the urban runoff diversions are controlled by Supervisory Control and Data Acquisition (SCADA) systems that allow the diversions to be turned off remotely in the event of wet weather, and to monitor the flow volume. Rainwater diversion valves are used on two of the diversions to deactivate those discharges.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

**DWURO:** <https://www.ocsd.com/services/urban-runoff>

Resolution No. 13-09 (page 80)

OCSD Answers to Questions About: Urban Runoff Diversions - September 2017

Urban Runoff Diversion Program (presentation) – April 2018

**GWRS:** <https://www.ocwd.com/gwrs/the-ocwdocsd-partnership/>

Press Release: AB 2022 Signed by Governor Brown – October 2, 2016

CBS Los Angeles: From Toilet To Tap: Bottles Of Purified Recycled Wastewater Handed Out In Hollywood – June 21, 2017

ABC Los Angeles: Toilet to Tap Water Project a Tough Sell – June 21, 2017 (video)

News Deeply: Magic in a Bottle: Orange County Launches Recycled Water Giveaway – Jul 3, 2017

NBC Los Angeles: OC Aims to Break World Record for Water Recycling – February 16, 2018 (video)

Guinness World Records: Most wastewater recycled into drinking water in 24 hours – February 16, 2018

Press Release: OCSD and OCWD Win Award for GWRS Bottled Water Campaign – April 24, 2019

**Performance Measures & Results**

<b>Measure</b>	<b>Targets</b>	<b>Outcomes</b>
Dry Weather Runoff Capacity	10 MGD	9.4 billion gallons since 1999
Secondary Treated Effluent Delivered for Water Recycling	130 MGD	130 MGD
Wastewater Reuse	100% by 2023	>50% of total flow (current)

# Orange County Water District, CA

## Water Reuse



### Application Part 1: Background Information

Utility Name: Orange County Water District		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Advanced Water Purification Project		
Service Area (square miles): 430 square miles	Average Annual Daily Flow or Demand (MGD): 100 MGD	
Population Served: 2.5 million people served by 19 member agencies in north and central Orange County		
<b>Location</b>		
Street Address: 18700 Ward Street		
City: Fountain Valley	State: California	Country: USA
Zip Code/Country Code: 92708		
<b>Utility Representative Contact Information</b>		
Name: Diane Pinnick	714-378-3228	dpinnick@ocwd.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		

In what year did the utility achieve recognition as a Utility of the Future Today?
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.
<input type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>61</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency <input type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>62</sup> <input checked="" type="checkbox"/> Activity Area 6: Water Reuse <input type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>63</sup> ( <input type="checkbox"/> IGP)

**Application Part 2: Organizational Culture**

The **Orange County Water District** (OCWD; the District) has pioneered groundwater management for more than 80 years and water reuse for nearly 40 years.

OCWD was established in 1933 by the California Legislature to protect the county’s rights to Santa Ana River water and to manage the Orange County Groundwater Basin. The 270-square-mile basin fulfills about 77% of the water needs for 13 cities, five retail water districts, and one investor-owned water utility in north and central Orange County, located in Southern California. Together, they serve more than 2.5 million citizens and businesses within the sixth largest county of the nation (by population).

A 10-member board of directors governs the District and implements policies that foster sound management of the basin, as well as supports the advancement of OCWD's mission to provide a reliable, high quality water supply in a cost-effective and environmentally responsible manner. Seven board members are elected and three are appointed by Anaheim, Fullerton and Santa Ana city councils.

To meet the challenges of groundwater depletion, seawater intrusion from the Pacific Ocean, and unreliable surface water supplies, OCWD, with the Orange County Sanitation District, created the **Groundwater Replenishment System (GWRS)**, which came online in 2008. It is the **world’s largest advanced water purification project of its kind**— purifying wastewater and providing 100 million gallons of near-distilled quality water each day. The GWRS is considered the gold standard for both indirect and direct potable reuse projects and is replicated in several U.S. cities, in Singapore and in Australia.

OCWD's Board of Directors and staff take on the water challenges of today and prepare to meet the region's water demands for generations to come. Solid science and state-of-the-art technologies guide their decisions. OCWD is committed to the following values:

- Sound Planning and Investment
- High Standards for Water Reliability
- Exceptional Water Quality
- Environmental Stewardship
- Sound Financial Management

For decades, OCWD has worked with the U.S. Army Corps of Engineers (Corps) to capture more stormwater behind Prado Dam to minimize the loss of stormwater to the ocean and maximize what is put

into the groundwater basin—recently, utilizing advanced forecasting tools such as Forecast Informed Reservoir Operations (FIRO).

OCWD's Philip L. Anthony Water Quality Laboratory ensures quality water and is one of only three public agency labs in the nation to provide a full Unregulated Contaminants Monitoring Rule 3 (UCMR3) program. It is also the first public agency lab in California to achieve state certification to analyze for per- and polyfluoralkyl substances (PFAS).

The District is an environmental steward, managing the natural environment of the Prado Basin and the area surrounding the Santa Ana River downstream for purposes of greater water yield while protecting endangered species.

OCWD has dedicated more than 1,100 acres of land for environmental preservation and invested millions of dollars for conservation. In addition, OCWD has dedicated more than 200 acres of its lands for public trails and recreation.

The District's audited fiscal year 2018 financial statements, unrestricted cash and investments totaled \$160 million. The fiscal year 2019-20 budgeted expenditures total \$247.8 million and include capital and operations and maintenance costs. Since 2008, OCWD has maintained the 'AAA' rating assigned by Fitch and S&P, a testament to its financial health.

OCWD is committed to public education of school ages through adults through its robust speakers bureau and tour programs and the Children's Water Education Festival—the largest of its kind in the nation, among others. It also brings together international water industry professionals and scientists and legislative stakeholders through projects, such as the annual OC Water Summit, to discuss challenges and solutions.

The District shares water reuse technology with other cities, states and nations in a humanitarian effort and, in a spirit of collaboration, to advance current knowledge for the betterment of all.

OCWD research staff have worked with the membrane industry for many years to improve the performance of membrane technologies. The information gathered on the operation and reliability of the unit treatment processes employed in the GWRS has been invaluable to other agencies seeking to develop both indirect and direct potable reuse applications. OCWD board and staff members have made numerous presentations on all aspects of the GWRS locally, regionally, nationally, and internationally. The willingness to share information, data, and insights has been one of the hallmarks of the GWRS project and OCWD.

District staff have also been called as experts in fashioning groundwater- and water reuse-related legislation, both statewide in California and nationally. For example, OCWD's management of its groundwater was a model for the legislation of California's State Groundwater Management Act (2014).

The Orange County Water District is committed to excellence and that includes its staff. OCWD recruits for individuals with a strong interest in learning about the District and its operations and not just their job duties. It encourages department managers to cross train their staff, especially for those roles where there may be one individual in a specific job classification.

The District offers an education assistance program for regular full-time employees in obtaining skills and knowledge to become better qualified for current duties and to prepare for potential advancement.

OCWD recognizes individuals with strong leadership skills and works to assist them in enhancing their skills. District management works together to identify and mentor employees that show great promise to move up as openings occur. Those staff are mentored and trained by attending outside training classes, working with a leadership consultant, and internal mentoring and training with Human Resources. In 2019 thus far, 60% of positions filled were internal promotions.

In addition to leadership development, OCWD supports focused training as employees promote to positions that have direct supervision of other staff. All new supervisors must train with Human Resources on District polices, practices, culture, etc. OCWD supports attendance at an excellent leadership training program for water utility employees offered by the Association of California Water Agencies Joint Powers Insurance Authority (ACWA-JPIA).

Safety is a high priority at OCWD. District safety staff conduct safety training, manage the Emergency Response Plan, monthly Safety Review meetings, workers' compensation program management, security and security policies, as well as hazardous materials handling for the operations and laboratory groups. Employees are rewarded for their suggestions and contributions to enhance safety processes and are encouraged to bring forward any gaps they may see that can be improved upon. The extensive, year-round safety training program is done by in-house training, outside vendors or attendance at off-site locations.

OCWD has encouraged wellness for over 10 years and has received the ACWA-JPIA Wellness Grant for the past five. The Wellness Program focuses on promoting healthy living through educational initiatives and recreational activities and fitness training. Events include Annual Health Fairs and Longevity Screenings, and various cooking and healthy snack demos, mini-massage days, and gym membership discounts. OCWD also has an onsite fitness facility with equipment to facilitate an optimal fitness routine.

District employees receive their information from their supervisors, a monthly newsletter, the website, an Intranet portal called Waterweb, the OCWD Today electronic news board, at board meetings, and at the quarterly All Employee Meeting—a rally of enthusiasm and an opportunity to publicly ask questions and receive answers and the most recent company updates by upper management.

The Employee Recognition Program allows staff to give a shout-out to fellow workers for going above and beyond their normal duties. These are read at the All Employee Meeting. The employee of the quarter and year program features submission, by supervisors, of outstanding employees and their noteworthy achievements, which are then voted on by all staff. The winning employee receives a plaque and a gift and recognition in the media vehicles, previously mentioned.

OCWD and its staff are recipients of more than 100 awards for outstanding achievement for water reuse, groundwater management, environmental stewardship, community outreach and education, and more. As example, the GWRS received the Guinness World Records™ title in 2018 for the most wastewater recycled to drinking water in 24 hours. In 2019, it received the Mercury Award for its GWRS Bottled Water Campaign that brought information and bottled reused water to California events to gain support for water reuse.

The District's plans to secure new water supplies include expanding the GWRS one final time in 2023 for a total of about 130 million gallons of "new" water per day—enough for 1 million people. It is working with the U.S. Army Corps of Engineers to store even more stormwater behind Prado Dam to be let out during drier times and captured by OCWD. It is exploring the Metropolitan Water District of Southern California's proposed reuse project that could bring the District 65,000 acre-feet per year of reliable, high-quality water in lieu of imported water, and it is researching to expand its water supply portfolio through ocean desalination.

OCWD and its staff were visionary and continue to be trail blazers. The Orange County Water District epitomizes the Utility of the Future Today and we thank you as you consider us for this recognition.

### **Application Part 3: Activity Area – Water Reuse**

#### **Overview**

The Orange County Water District (OCWD; the District) can be thought of as a wholesaler and its 19-member agency Producers as "retailers." OCWD works closely with its Producers to ensure adequate groundwater supplies are available to local communities. The groundwater basin is replenished by

precipitation/runoff, stormflows, Santa Ana River water, imported water (Colorado River or State Water Project), and highly-treated recycled water.

In order to sustain current and future groundwater yield requirements, OCWD implemented water reuse on a large scale—the Groundwater Replenishment System (GWRS). The GWRS purifies secondary treated wastewater from the Orange County Sanitation District (OCSD), which is the wastewater collection, treatment and disposal agency for this service area. The main component of the GWRS is the Advanced Water Purification Facility (AWPF). The AWPF produces 100 million gallons per day (mgd) of highly treated, ultra-pure quality water. The AWPF uses advanced treatment technologies: microfiltration, reverse osmosis, and advanced oxidation with ultraviolet light and hydrogen peroxide.

About one third (30 mgd) of the water produced by the AWPF is injected near the coast of the Pacific Ocean at 36 individual injection well sites to prevent seawater intrusion into the Orange County Groundwater Basin. The other two thirds are surface spread in a series of percolation ponds to replenish the groundwater aquifer.

In addition, OCWD operates a smaller (6 mgd) non-potable reuse facility known as the Green Acres Project (GAP). GAP also takes secondary treated wastewater from OCSD, but uses a more conventional chemical coagulation and media filtration treatment process along with chlorine disinfection to produce a tertiary quality recycled water. This water is used to irrigate local parks, golf courses, and is used for some industrial cooling purposes.

### **Question and Answer**

How did you implement the practices/activities/programs described in your Overview?

During the mid-1960s, the District began a pilot project with the Los Angeles County Flood Control District to stop seawater intrusion from the adjacent Pacific Ocean to wells as far as five miles inland, by injecting imported water to form a hydraulic barrier. At another basin location, OCWD injected treated wastewater to create the barrier. Upon careful analysis, the California State Board of Public Health approved a full-scale project to allow the use of treated wastewater for this purpose. As a result, a facility called Water Factory 21 (WF 21) and a series of 23 injection wells became operational in 1976.

Secondary treated wastewater from OCSD's adjacent campus, was delivered to OCWD for advanced treatment. WF 21, built with a capacity of 15 million gallons per day (MGD), utilized RO, chemical clarification, air stripping, recarbonation, filtration, granular activated carbon absorption, and chlorination.

The new facility soon won international acclaim for its 21st century technology, which, at one time, included acknowledgement as the world's largest operating reverse osmosis plant treating municipal wastewater.

For 15 years, WF 21 not only complied with all drinking water regulations, but also introduced numerous cost-cutting innovations. In 1991, WF 21 successes were rewarded when the California Department of Health Services granted OCWD a permit (the first ever issued) to inject 100 percent recycled wastewater, without blending.

In the 1990s, OCWD determined that it needed to expand WF 21 and address continued problems with seawater intrusion and supplying the needs of a growing population. At the same time, OCSD faced the challenge of having to build a second ocean outfall. The Groundwater Replenishment System resolved these issues.

What resources supported implementation?

Both districts shared the cost of constructing the 70 mgd GWRS (\$481 million U.S. dollars). OCSD supplied OCWD with stringently controlled, secondary treated wastewater at no charge. OCWD agreed to

manage and fund GWRS operations. Through this collaboration, the GWRS emerged as one of the most celebrated civil engineering and water reuse projects in the world.

Operational since January 2008, this advanced water purification project now produces 100 mgd of high-quality water each day—enough to meet the needs of nearly 850,000 residents. It also decreases dependence on costly imported water, uses one-third the energy required to desalinate seawater and protects the environment by reusing a precious resource.

By 2015, OCWD had invested an additional \$142 million to expand the GWRS to its current production capability of 100 mgd.

The GWRS requires a staff of 58 persons to operate and maintain the facility, over 50% of which were added as a result of the construction of the GWRS. This required an increase in the OCWD operating budget and cost of groundwater sold in order to support the implementation of the GWRS.

Did you partner with other stakeholders or organizations?

OCWD had a key partnership with OCSD that was required to make the GWRS project successful. This partnership includes assurances on water quality from OCSD and OCSD absorbing costs to treat and dispose of residual streams from the AWPf. OCSD's cost share amounted to \$192 million for the initial capital costs of the project.

OCWD also had key partnering relationships with several regulatory agencies including the California State Water Resources Control Board and the California Department of Public Health (now known as the Division of Drinking Water or DDW.)

What were critical obstacles to overcome to be successful?

At the time of the start of the GWRS in 2008, regulations governing the use of highly treated recycled water for indirect potable reuse in California were in draft form only. For the GWRS to receive regulatory approval, including an operating permit from the California Regional Water Quality Control Board, OCWD had to work closely with DDW staff to collaborate on terms and conditions for the operation of the GWRS. This was one of the largest obstacles to overcome for the project to be successful.

Another large obstacle was overcoming negative public perception about indirect potable reuse. Predecessor recycled water projects in other parts of California had been unsuccessful due to public acceptance issues. OCWD was able to overcome this obstacle through a robust public outreach program that started during the conceptual design of the project and continues to the present.

Has “smart” information technology supported your implementation/optimization?

The GWRS process is controlled by a computer system commonly referred to in most treatment facilities as a Supervisory Control and Data Acquisition (SCADA) system. For the GWRS project it is referred to as a Process Control System (PCS).

The PCS is an open, expandable, PC-based system, offering greater speed, capacity and functionality for this large, mission-critical application. The GWRS PCS is a Delta V digital process control system and distributed control system supplied by Emerson Process Management. The PCS software can be upgraded in the future as necessary.

Besides being easy to use, the Delta V PCS has excellent trending capabilities, superior graphic display capabilities and fast response times. The PCS provides simpler operations and maintenance, allowing for fewer operations staff to manage complex facilities. In addition to AWPf operation and control, the PCS provides management of data and electronic records. OCWD operations and maintenance staff can take advantage of predictive technologies provided by the PCS to avoid unplanned shutdowns and eliminate

mundane unnecessary tasks. The device diagnostics are part of the Delta V PCS, allowing for predictive maintenance.

Where could other utilities go to find additional information?

The public can find more information on the GWRS and the programs used by OCWD for the large-scale implementation of water reuse at OCWD's website (ocwd.com). The website includes detailed information of OCWD's groundwater management practices including the use of water reuse as part of its overall groundwater sustainability plan.

## **Performance Measures & Results**

Water beneficially reused

OCWD puts back approximately 330,000 acre-feet every year into the Orange County Groundwater Basin. Of that amount, about 30% is GWRS water.

About 30 million gallons of GWRS water is used to inject in seawater barrier wells and the remaining 70 million gallons is sent via pipeline to recharge facilities in Anaheim.

Ratio of reuse quantity vs. wastewater volume processed

OCWD takes 130 MGD of wastewater from the Orange County Sanitation District and produces 100 MGD of advanced purified GWRS water.

Environmental benefits

The TDS concentration of local groundwater ranges from 300 to 700 mg/L. The GWRS water at a TDS of approximately 50 mg/L significantly improves this situation.

Comparison of OCSD's pre-NdN operation (before late 2009) with the post-NdN operation of the activated sludge facilities at Plant No. 1 (after 2010-11) reveals that secondary effluent total nitrogen concentrations decreased by about 50% in recent years as compared with average Q1 total nitrogen levels in 2008-09 of approximately 26 to 28 mg/L.

GWRS leaves 100 mgd more water in the State Water Project and/or Colorado River.

GWRS protects the Orange County Groundwater Basin from seawater intrusion.

GWRS reuses a wasted resource.

Local supply

Reduced dependence on purchased water and energy used to treat purchased water

The natural flows from the Santa Ana River are captured to the maximum amount possible. The use of GWRS water replaces import water demand on a gallon for gallon basis and saves Producers \$45 million per year.

GWRS recycled water is processed using approximately 5,000 kwh per mg of final product water and producing CO2 greenhouse gas emissions of 1,400 lbs/acre-foot of potable water. This energy footprint and greenhouse gas emissions are approximately half that of imported water.

Climate-independent water supply of reuse water

The GWRS generates enough locally-controlled, drought-proof new water to meet the needs of 850,000 people, reducing the region's reliance on costly and drought-restricted imported water.

Producers currently receive 77% of their water supply from the groundwater basin. Without the GWRS, this would decline to 52%.

The GWRS currently takes 100% of reclaimable wastewater from OCSD Plant 1. With the final expansion, 100% of the reclaimable wastewater in OCSD Plant 2 will also be used. This will amount to 175 mgd of reclaimable wastewater used.

#### Costs for treated water

Groundwater currently has a unit cost of \$525 acre-foot (AF). It is subsidized by grants, which allow OCWD to charge \$462 an acre-foot to pump versus the cost of imported water at \$1,130 AF. The cost of groundwater will increase to \$487 an acre-foot beginning July 1, 2019.

#### Level of public acceptance of reuse commitments

The GWRS continues to gain letters of support from its stakeholders and the community—the most recent from a local nursing school program administrator who has made the tour a part of the students' curriculum. This past year, 5,000 guests enjoyed 180 tours of the GWRS. Surveys showed that those who strongly support advanced purified wastewater as part of their drinking water supply nearly double (34.14% to 64.40%) after the tour and tasting. The GWRS received 1,768 positive media impressions and reached about 705.8 million people.

#### Use of advanced treatment

The AWPf features MF, RO, and UV/AOP advanced water treatment processes applied to 100% of the influent flow stream, followed by decarbonation and lime stabilization post-treatment processes, with large pumping stations to convey the purified recycled water.

#### Type and use of enhanced disinfection of reuse water

The UV/AOP system consists of two steps: hydrogen peroxide addition and UV light treatment. UV light exposure is used for primary disinfection and for photolysis of UV light-sensitive contaminants such as N-nitrosodimethylamine. Hydrogen peroxide exposed to UV light produces hydroxyl radicals that result in advanced oxidation to destroy UV-resistant contaminants such as 1,4-dioxane. The closed, in-vessel type UV system utilizes low-pressure high-output lamps. The UV system is arranged with 13 trains. Each train contains six reactors and has a rated maximum capacity of 8.75 MGD for a total of 113.75 MGD with all trains in service.

# Pittsburgh Water and Sewer Authority, PA

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: Pittsburgh Water and Sewer Authority		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Large water and sewer municipal authority with water distribution and treatment facilities, stormwater management, and sewer collection and a regional conveyance/interceptor system (to regional treatment entity ALCOSAN).		
Service Area (square miles): Approximately 60 square miles	Average Annual Daily Flow or Demand (MGD): Approximately 80 MGD (dry weather)	
Population Served: 500,000 people (120,000 customer accounts, including wholesale accounts)		
<b>Location</b>		
Street Address: Penn Liberty Plaza I, 1200 Penn Avenue		
City: Pittsburgh, PA	State: 	Country: United States of America
Zip Code/Country Code: 15222		
<b>Utility Representative Contact Information</b>		
Name: Will Pickering, Sr. Manager of Public Affairs	Phone: 412.255.8800, Ext: 2881	Email: WPickering@pgh2o.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name: n/a	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b>		
Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? PWSA has not been recognized previously		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>64</sup> <input type="checkbox"/> Activity Area 3: Energy Efficiency		

<sup>64</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>65</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>66</sup> ( IGP)

## **Application Part 2: Organizational Culture**

The City of Pittsburgh has reinvented itself many times over the years. It has been an important region for native American peoples and served as a staging area for the Lewis and Clark expedition. It later grew into an important outpost on the western frontier, anchoring the trade routes along the Allegheny, Monongahela and Ohio Rivers. During this time immigrants from across central and eastern Europe started flocking to the area looking for jobs and a better life. The City grew rapidly in the 19th and early 20th centuries into a major industrial hub and beacon of the Gilded Age. It then fell on hard times in the 1970s-1990s with the decline of the steel industry and heavy manufacturing. Most recently it has transitioned from a gritty former center of heavy manufacturing to a renowned technology and medical services hub with several world-class universities such as Duquesne, Carnegie Mellon and the University of Pittsburgh. This history is important to understand as the organizational culture and attitudes at Pittsburgh Water and Sewer Authority (PWSA) have echoed those of its parent City. The culture at PWSA is now one of reinvention and innovation, where historical ideals about work ethic and collectivism are being infused with best practices and strategic solutions.

The water and sewer systems in Pittsburgh grew with the development of heavy industry starting in the mid-1800s. At its apex, the systems were a glistening symbol of glided age and post WWII expansion with stunning neoclassical and art deco facilities. The people and culture at the predecessor organizations of PWSA mirrored those in the City. They were largely comprised of hard-working first- and second-generation immigrants who felt a responsibility to provide quality services to help the population and the industrial base prosper. There was a strong mentality of collective good, which fostered a strong team environment. Unfortunately, when the tides of the City turned so did the attitudes and culture at PWSA's predecessor. Management turnover, decades of inadequate funding, and politics took their toll.

Now, PWSA is starting to turn things around. A new leadership team has raised rates by nearly 50% and tripled planned capital expenditures to address service problems and fix failing assets. PWSA has moved under the jurisdiction of the Pennsylvania Public Utility Commission, resolving many of the longstanding inconsistencies with service levels and practices. Perhaps most importantly, a new culture is taking root. It's a culture of "getting stuff done" and finding innovative solutions. This culture is fostered by an increasingly diverse workforce. People from different backgrounds are coming from outside the area to work at PWSA. They are bringing new ideas and new vitality.

PWSA now has a compelling story to tell about overcoming decades of mismanagement and neglect. It includes how the organization put forth a bold plan called Focusing on the Future to combat the naysayers and forces aligned to prosper from the organization's challenges. When times were toughest, instead of retreating, PWSA opened its doors through public meetings, tours and a public-facing performance dashboard – Headwaters to fully reveal the successes and the challenges it is facing. It has created deep partnerships between embedded consultants and staff to turn around every major department of the organization. It even took on the challenge of replacing a large percentage of the lead services lines in the system that threatened water quality and the seemingly insurmountable stormwater challenges of the

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<sup>65</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>66</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

region. All these activities were facilitated by PWSA's evolving culture of "getting stuff done" and finding innovative solutions.

More specifically, PWSA has recently made major investments related to partnerships, community engagement and outreach. Within the last two years, the Department of Public Affairs has grown from two to eight full-time employees. This department is currently managing a major redesign of the PGH2O.com webpage with a focus on accessibility and transparency for all of its diverse stakeholders. PWSA's team of communicators is also responsible for publishing a comprehensive monthly newsletter for employees and customers called Currents. This periodical has proven popular with an online readership of over 1,000 customers and the content is shared with over 7,300 followers on the @pgh2o Twitter feed. PWSA also provides an abbreviated version of Currents in each monthly customer bill.

Digital community engagement is a two-way street at PWSA. Thanks to a robust social media presence, customers can report problems and get answers to questions about every aspect of the organization using Twitter, Facebook and Nextdoor. In 2018, the Public Affairs team fielded 548 unique service requests via social media, and over 98 percent of requests were responded to within three days.

PWSA recognizes that connecting with stakeholders requires digital and more traditional analog investment. PWSA's Executive Director is committed to attending as many community group meetings as possible to share his vision for the future of the organization, explain upcoming projects, and most importantly listen to feedback from the public. This calendar year, PWSA has already attended over 40 meetings across its service territory. Meeting topics range from stormwater management, community lead response projects, rate changes, and customer bill assistance programs.

The results of PWSA's culture change have been dramatic. In 2018 alone, PWSA made big strides in improving operations and making a difference for its customers. For example, customers used to wait nearly 5 minutes on average to speak with a customer service representative. When you call PWSA now, you'll speak with a representative within 1 minute. In addition, 98% of the 178,000 customer calls PWSA received in 2018 were handled on first contact. The City of Pittsburgh's waterways are also cleaner, and its streets and properties are better protected from flooding because PWSA annually removes over 2,114 tons of debris from storm drains – that weighs more than 13,000 Pittsburgh Steelers offensive linemen. In fact, 81% of the 54 performance measures tracked on PWSA's Headwater performance dashboard showed improvement. These efforts have resulted in \$445,000 in cost savings to PWSA, which have been reinvested in the system to enhance reliability. In addition, through PWSA's employees' commitment to customers, the total impact of improvement efforts to customers is more than \$1.6 million. These successes are coming from within the organization, many of which are organized under an initiative called Watermark that helps PWSA build a culture of continuous improvement. PWSA is focused on the five goals:

**Protect Public Health and the Environment** - To protect and support the long-term health of our community and environment

**Ensure Customer and Stakeholder Satisfaction** - To enhance customer and stakeholder confidence by communicating effectively and engaging our community

**Improve Infrastructure Reliability** - To ensure service reliability through responsible infrastructure investment and proactive maintenance

**Maintain a High-Performing Workforce** - To recruit, develop, and retain a motivated and well-qualified team

**Be an Efficient and Effective Organization** - To optimize the use of our resources through innovative technology, effective processes, and continuous improvement

These are from PWSA's strategic plan, *Focusing on the Future*, which employees and leadership developed as part of the continuous improvement effort.

The story of PWSA is still being written. Most of the facilities and the pipe networks remain old and failing. And, there is still a lot of work to be done to align the unionized workforce with the current needs of the organization. The forward progress that has already been made can easily regress. The dedicated group from PWSA is fighting every day to ensure things keeping moving forward.

### Application Part 3: Activity Area - Partnering & Engagement

One of PWSA's five strategic goals captured in its Focusing on the Future plan is **Ensure Customer and Stakeholder Satisfaction** - To enhance customer and stakeholder confidence by communicating effectively and engaging our community. PWSA and its staff see this as a cornerstone of being a successful utility and one of the first areas that PWSA's new leadership team attacked. This is the area where PWSA has made the most progress in the last few years and the area that it seeks recognition under the Utility of the Future Today – Joint Recognition Program (**Activity Area 2: Partnering & Engagement**). To enhance Partnering & Engagement PWSA has engaged in the following activities:

**Partnering and Community Engagement on Important Issues** – PWSA has several active stakeholder groups that help develop policies, practices and guidance in critical areas. These include a Community Lead Response Advisory Committee (CLRAC), Low Income Assistance Advisory Committee, and a Stormwater Advisory Group (SWAG). These groups meet regularly and include members of Pittsburgh various advocacy organizations such as Pittsburgh United, members of the public, elected officials, as well as representatives from PWSA and the Pennsylvania Public Utility Commission (PUC).

**Peer Relationships** – There is a long-standing and well-developed relationships between PWSA and the Allegheny County Sanitary Authority (ALCOSAN) that provides wastewater treatment services to 83 communities, including the City of Pittsburgh. The two agencies work closely together on shared stormwater issues, conveyance of wastewater/stormwater and on joint billing. In addition, PWSA has well developed and prosperous relationship with several utilities surrounding Pittsburgh. PWSA provides services to some like Aspinwall and Reserve Township through whole sale agreements and to others through technical assistance and advocacy. Finally, there is a cooperative relationship between PWSA and Pennsylvania American Water Company, the large private supplier that provides services to a portion of Pittsburgh and areas outside the City. PWSA also participates in the U.S. Water Alliance's Water Equity Task Force. The Water Equity Taskforce is a network of cities that work together to develop more equitable water policies and practices. The project aims to increase understanding of the challenges, opportunities, and promising interventions to promote equitable water management in each participating site and at the national level.

**Quality of Life** – PWSA donates services including water and personnel to support various community efforts such as the community gardens, a zoo and public fountains. They also maintain several recreation areas including the prominent Highland Park Reservoir area, which is a regional hot spot for jogging, walking and nature viewing.

**Web Presence and Social Media Engagement** – PWSA recently revamped its web page with a host of interactive content. For example, it's now possible to look at an interactive map that shows lead service lines and the efforts to remove those lines across the service area. The web site includes videos and a mountain of educational and community content. PWSA has a large and active engagement internal engagement team including dedicated specialist in outreach and social media. You can find the website at [www.pgh2o.com](http://www.pgh2o.com).

**Community Conversations** – There have been dozens of community outreach events over the last few years throughout the PWSA service area. Many of these have included the Executive Director and other senior staff. There have been multiple general Q&A sessions, as well as subject matter specific sessions on water rates, ownership (privatization), engineering projects, lead service lines, and stormwater/flooding.

Almost all the programs and activities mentioned in this section have been executed through a close partnership between internal staff, consultants and community groups. PWSA maintains on-call contracts with several firms to provide as needed services in these areas. Ideas for new initiatives have come from many sources. PWSA staff come from other utilities such as DC Water and prominent local and national firms. They have brought their experiences at other organizations to PWSA. This avenue has generated many ideas for programs. PWSA staff are also very active in the national utility organizations such as NACWA, WEF, AWWA and AMWA. This involvement has produced ideas for several initiatives. PWSA staff have also listened closely to the needs and wants of stakeholders including customers, the PUC, the Pennsylvania Department of Environmental Protection, elected officials, and community groups such as Pittsburgh United. PWSA's strong social media presence and its community engagement through public events are all venues for getting this feedback. All these sources have created areas for programs.

The extensive level of customer and stakeholder engagement by PWSA is not cheap, but it is a relatively minor investment for PWSA in the context of their \$190 million dollar per year budget. PWSA has five full time people dedicated to public communications and engagement. This is an estimated expense of roughly \$400,000 per year, but it only accounts for a small amount of the total stakeholder engagement labor expended by PWSA. Several of the senior staff also spend many hours per week on stakeholder engagement activities from talking to customers to attending community meetings. It's a similar case of many of the managers in the organization. Stakeholder engagement is very important to PWSA and they invest accordingly. While this level of involvement has not been quantified, it is probably more than several thousand hours per year in total with a value in excess of \$300,000 per year. Additionally, PWSA has used several strategic consultants to assist with engagement efforts. They have provided services such as designing the Focusing on the Future document and the Headwater performance dashboard. Approximately \$300,000 per year is devoted to these services. In total, this roughly \$1 million investment may seem like a lot, but it less than 1% of the total budget.

Perhaps the biggest obstacle that PWSA overcame to implement its Partnering & Engagement activities was the perception that PWSA was a failing utility. When PWSA started its outreach efforts it had been through several highly critical audits and was the subject of unrelenting negative press. There was talk of privatizing and senior management had turned over many times in the past decade. There was inadequate investment in infrastructure and the staff was demoralized. There was a feeling among many at PWSA that the utility should keep its head down, tighten its belt financially and just try to weather the storm as quietly as possible. It took strong leadership with vision and perseverance to convince the PWSA Board of Directors, staff and the public that a more transparent and engaging approach was worth it.

While technology was not the foundation or the driver for PWSA's Partnering & Engagement activities, they did provide a strong support. The PWSA website <http://lead.pgh2o.com> includes interactive lead service line maps, educational videos, and other content that requires a reasonable amount of technology. The lead service line map, for example, requires a robust Geographical Information System (GIS) database and a team to keep it updated. PWSA also can query information from its smart AMI meter network for various customer data related to consumption. Among the other technology supports PWSA uses is a robust interface with social media platforms for tracking and managing data.

Other utilities wanting to learn from PWSA's experiences have many options to get more information. They can start with the PWSA website [www.pgh2o.com](http://www.pgh2o.com). It has a wealth of information. They can also contact me, Will Pickering, Sr. Manager of Public Affairs by phone at 412.255.8800, Ext: 2881 or by email at [WPickering@pgh2o.com](mailto:WPickering@pgh2o.com).

Below are a number of measures that PWSA tracks related to Partnering & Engagement. Note that these measures come from the Headwater performance dashboard. PWSA would love to provide screenshot of these indicators showing how they are represented with graphs, charts, and images, but the application says no attachments, graphics, charts, photos or additional materials as part of an application package. Therefore, we are only populating the table of metrics from the application.

<i>Measure What are you measuring?</i>	<i>Targets What was your goal/intended outcome?</i>	<i>Outcomes What were your actual outcomes?</i>
<i>Percent of Media Mentions Based on PWSA Proactive Communications</i>	66.00%	34.40%
<i>Voluntary Subscriptions</i>	n/a	8,861
<i>Constant Contact Readership<sup>1</sup></i>	25.00%	44.00%
<i>Emails to <a href="mailto:info@pgh2o.com">info@pgh2o.com</a> Processed within 48 hours</i>	95.00%	59.00%
<i>Percent of Social Media Inquiries Addressed in 3 Business Days</i>	90.00%	100.00%
<i>Number of Formal Complainants Filed with Pa. PUC</i>	n/a	7
<i>No. of Informal Complainants Filed with Pa. PUC</i>	n/a	35

<sup>1</sup> Constant Contact is PWSA’s customer and stakeholder newsletter

# Queensland Urban Utilities, AU

## Nutrient Reduction and Materials Recovery



### Application Part 1: Background Information

Utility Name: Queensland Urban Utilities		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Provision of water & sewerage services and provision of recycled water, 29 Wastewater Plants and 116 Water Reservoirs		
Service Area (square miles): 5,554 square miles	Average Annual Daily Flow or Demand (MGD): Wastewater 101 MGD	
Population Served: 1.5 million residents		
<b>Location</b>		
Street Address: 2/15 Green Square Cl, Fortitude Valley		
City: Brisbane	State: QLD	Country: Australia
Zip Code/Country Code: 4006		
<b>Utility Representative Contact Information</b>		
Name: Colin Chapman	Phone: 0419 657 170	Email: colin.chapman@urbanutilities.com.au
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today? 2018

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

Activity Area 2: Partnering & Engagement<sup>67</sup>

**Application Part 2: Organizational Culture**

Queensland Urban Utilities was recognized in 2018 in Partnering and Engagement and is applying for recognition in 2019 for one additional activity area Nutrient Reduction & Materials Recovery and this application has submitted material for that activity area and omits application information related to Organizational Culture (Application Part 2) as per the directions provided within this application for Expansion of Recognition for Program Members.

**Application Part 3: Activity Area - Nutrient Reduction & Materials Recovery**

**Overview Paragraph:**

Queensland Urban Utilities (QUU) is a leading Australian utility for total nutrient discharge on a per-connection basis. QUU service territory is located within South East Queensland where utilities are the lowest emitters of nitrogen into waterways in Australia. This submission demonstrates how utilities can integrate the “Attributes of an Effectively Managed Utility” to drive outcome focused performance.

The regional environment serviced by QUU is valued at \$7.7B and we have a strong ambition to protect this vital resource. We remove some 6000t of total nitrogen (TN) and 600t of total phosphorous (TP) via our sewage treatment plants (STPs). Over the past 10 years this represents an 80% reduction in TN and a 53% reduction in TP released.

Currently QUU has 29 STP’s. Our licence is for 610 t/year of TN discharge under a novel bubble licence arrangement. This license incorporates 9 of our largest STP’s, and represents the majority of our nutrient discharge. In 2021 we have committed to reduce this total licence to 550 t/year of TN and planning for a future with no nutrient release. The shift from traditional point source control provides QUU with a unique opportunity to explore new technologies for removal and recovery and develop a nutrient abatement program which comprises a suite of fit for purpose solutions to enable far greater benefits due to a whole of catchments approach.

QUU in line with our infrastructure strategy and performance is actively seeking solutions to better utilise our existing assets and minimize capital investment for nutrient reduction. We are working with our regulator and our community to reduce the reliance on large centralized sewerage solutions towards effects based management for treatment solutions closer to the source.

Our nutrient abatement program key elements include nutrient offsets, adopting unique operational protocols and closing the loop via our recycled water schemes and increasing our recovery efforts.

As Environmental Leadership is one of our key strategic goals we continue to focus on novel and new ways to offset our nutrients and contribute to greater outcome for our communities and the receiving waters.

QUU operates a number of water recycling projects across our service territory where nutrients are indirectly recycled.

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<sup>67</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

QUU is also investing in a number of pilot research and development projects to improve the efficiency of nutrient removal and investigate future technology for cost effective recovery.

**Key Practices, Activities, Programs:** A summary of key practices, activities, and programs that QUU engage to realise our strategic targets and showcase a broad range of attributes are summarised.

**Beaudesert Green Infrastructure:** In an Australian first in 2014 QUU completed a major stream bank rehabilitation project (\$1 million) in place of undertaking an \$8 million upgrade of the Beaudesert STP. This nutrient offset project enabled QUU to offset nitrogen loads of 5 t/year while reducing sediment loads by an average 11,000 t/year and TP by an average 7 t/year.

**Laidley Green Infrastructure:** In May 2018 QUU successfully partnered with Healthy Land and Water, local land holders and farmers, the Port of Brisbane and Lockyer Valley Regional Council to complete our second nutrient offset project at Laidley valued at \$1.3 million. QUU rehabilitated 2 km of degraded stream banks preventing 10,000 t of sediment, 10 t/year of TP and 5 t/year of TN entering the waterway.

**Anammox for side stream:** Luggage Point our largest STP relies on ethanol dosing (costing \$500,000/year) to supplement the chemical requirement to achieve TN removal. A feasibility study completed by Aurecon in 2015, utilized findings via Research and Development project, to determine that an Anammox process was the most favorable technology to remove the necessity to dose ethanol. Anammox will be delivered for full scale in 2020.

**Nitrite Shunt:** This trial at Bundamba STP is providing a solid foundation for gateway investigation to further explore applications of short-cut nitrogen pathways at other STP's whilst also up skilling our staff in readiness for adoption. When implemented benefits include energy reduction by 30% due to less aeration and reduce carbon dosing. Significant capital investment (\$100s millions) associated with conventional plant upgrades can be delayed or avoided.

**Crops:** An Australian-first in 2016, QUU established a 4 hectare biodiesel crop of Pongamia trees at Toogoolawa and Boonah STP's with the aim of using a 120,000L/year of effluent. Each year over 1,400 kg of TN and 700 kg of TP is utilized and once the trees have matured they can be harvested to enable biodiesel production estimated to be worth \$14,000pa.

**Nutrient Capture:** While the economics of nutrient recovery are not yet viable in our region, QUU acknowledge that technology is evolving and is actively exploring a number of novel technologies to achieve recovery into the future. Projects include:

Eight of our 29 STPs utilise ponds for treatment, although they only treat 1% of our treatment flow the nutrients loads are problematic, hence regulation changes for regional STP's have need to be more stringent regarding nutrient release targets. QUU is leading a \$5.2million research project to explore a new combination of anaerobic treatment and high rate algae to create a high nutrient removal and capture treatment process. A valuable algae byproduct stream will be created and assessed in this project.

QUU has identified that decentralized treatment can provide multiple benefits for the business particularly relate to managing future capital assets. QUU with our partner the University of Queensland is developing an international leading technology called UGold to treat source separated urine and capture a nitrogen/phosphorous rich fertilizer.

**Future Sewage Treatment Plants:** QUU continues to partner with Universities, other utilities, consultants and industry partners to research new technologies promising to change the future of our operating environment for nutrient removal. Currently at our Innovation Precinct QUU is hosting:

A collaborative project investigating the combination of novel processes including high rate active sludge, Anammox/DAMO membrane biofilm reactors (MBfR) and free nitrous acid to create a future zero energy sewage treatment pilot.

A collaborative project to use free nitrous acid for sludge treatment to increase gas yields from digesters and improve the efficiency of nitrogen removal.

**Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Investment of over \$1 billion in STPs in South East Queensland has resulted in significant nutrient load reduction in estuaries and Moreton Bay over the past 14 years. Despite this investment and positive environmental outcome, modelling undertaken by QUU indicates that future investment in STP upgrades, even after implementing best practice end-of-pipe treatment technology (N:P ratio of 3:1), will not deliver the same level of environmental benefits that previous decade had achieved. New and innovative approaches are being developed to maintain and develop further positive environmental outcomes. A bubble licence for the Lower Brisbane catchment was established in August 2016. QUU is required to produce a load reduction target with a program of works every 5 years to the Queensland regulator, the Department of Science. QUU has established strategic targets which increase the utilization of assets to reduce nutrient discharge and increase reuse of water. There are also targets to implement new technologies for resource recovery and recycled water. QUU has a centrally lead research and development program which supports the organization to build capacity related to new technology and supports partnerships to build organization capability.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

QUU approach to nutrient reduction and materials recovery is organization wide and requires significant staff input and cross business support to deliver outcomes. Below are examples:

Following initial investment of both resources in excess of \$1M for the development of Australia's first Anammox Biomass, QUU is now investing approximately \$5M for the delivery of an Anammox side stream treatment process to remove 100t/year of total nitrogen;

The learning's of a \$450,000 investigation into efficient nutrient removal processes will provide QUU with an understanding of how to best meet our STP masterplan upgrade strategy. The strategy includes an \$18million upgrade to Luggage Point STP incorporating either simultaneous nitrification/denitrification and/or nitrite shunt. This investment will offset a BAU plant upgrade of \$120M.

We have now completed two nutrient offset green infrastructure projects valued at \$1M and \$1.3M which offset 5 t/year each.

QUU spent \$280,000 on a pongamia plantation to reuse 1.4 t/year of nitrogen in the process of developing a new feedstock. This large full scale trial proves benefit now, but also building both QUUs and our regulators understanding of a circular economy.

QUU is collaborating with around \$20million of research to investigate future zero energy nitrogen removal technology and nutrient capture. This has been enabled by our Innovation, Research and Development program and our World renowned Innovation Precinct.

Did you partner with other stakeholders or organizations as a part of your implementation process?

QUU worked with our State Regulator the Department of Environment and Science and Catchment Management Group to develop a bubble license, which is unique first for Australian utilities.

Due to Australia's strict quarantine laws QUU commenced developed a seed stock of Anammox in 2010 in a collaborative research project lead by the University of Queensland. QUU then partnered with both Veolia for the ANITA Mox process and Paques for their side stream Anammox technology. QUU now has contracted Veolia to deliver a 1,000 m<sup>3</sup> side stream Anammox process by October 2020. Currently we are actively growing 50 m<sup>3</sup> of seed stock in partnership with Veolia.

Jacobs completed options study for QUU to assess the benefits of Ammonia Based Aeration Control (ABAC), Simultaneous Nitrification/Denitricion (SND) and nitrite shunt for two of our large STPs. QUU in partnership with Jacobs and the University of Queensland are developing a full-scale reconfiguration of an operating train Bundamba STP to explore the application of these efficient nitrogen removal technologies.

Research projects related to futures STPs have been collaborative with cash and in-kind support made available by partnerships with Melbourne Water, DC Water, South Austalia Water, Queensland Government, Southern Cross University, Wide Bay Water, Gold Coast Water and Western Australia Water Corporation.

QUU is leading research into novel regional treatment methods for nutrient removal. This work will include a trial operated within the Lockyer Valley Regional Council area and within the service territory of our partner Norther Territory Power & Water Corporation. Our regulator the Department of Environment and Science is a partnering to support the project benefits realisation. Technology, research and engineering support is provided by University of Queensland, University of Western Australia and Aquatec Maxcon.

We are developing technology such as UGold for source separated nutrient recovery with our partner the University of Queensland. We will look to key partners such as Southbank Parklands and manufacturer ABR.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

It has been important to engage our regulator as we move forward with novel approached to nutrient recovery. By enabling a bubble licence, QUU is now achieving a better result for our customers, community and the environment. We are less concerned with plant upsets and can explore new technologies at full scale.

To expand research and development opportunities it was vital to have access to premises where we can house pilot work and work closely with our partners. Our innovation precinct has enabled us to achieve this.

Technology development is difficult for all products emerging from research into full scale applications. We have an advanced solutions team who focus on the development of business case assessment and work to create partnerships to assist in moving technology from research and development to full scale application.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

QUU has a digital transformation strategy which incorporates analysers, data, data handling. Data and analysers are particularly key to novel methods for operation of processes like Anammox, ABAC, SND and nitrite shunt. These analysers are new for our business. Our Innovation Precinct enabled us to engage with analysers and data early and has set us up well for use of these more widely into the future.

In projects like the regional treatment project we are partnering with the University of Western Australia computer science and software engineering department to explore predictive analytics, low cost analysers and data for efficient operation of these remote plants with low onsite operator support.

Beyond these network analytics, environmental water data analysis, smart network analysers and data are critical and integrated into all of our new treatment processes and explored in our novel research applications.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

For additional information in relation to our Beaudesert Greenfield offset project click on these links:

<https://www.youtube.com/watch?v=Bhn89fBeuAM> and

<https://www.youtube.com/watch?v=MkRgV0iJxNM>

For additional information in relation to our novel UGold technology, check our partner’s website:

<https://www.uq.edu.au/news/article/2017/12/pee-power-production-possible> and explore this link:

<https://www.youtube.com/watch?v=9uXL3tekAA8>

For additional information in relation to QUU’s Innovation, Research and Development Projects, click on the link: <https://www.urbanutilities.com.au/about%20us/innovation>

For additional information in relation to Future Innovation at Queensland Urban Utilities, click on the link: <https://www.youtube.com/watch?v=GwgSard6YKg>

**Performance Measures & Results:**

<b>Measure</b> <b>What are you measuring?</b>	<b>Targets</b> <b>What was your goal/intended outcome?</b>	<b>Outcomes</b> <b>What were your actual outcomes?</b>
<b>Asset utilization</b>	10% increase in capacity utilization	Anammox delivers 100t/year of nitrogen removal using existing tankage
<b>Reduce emissions to water, air and land</b>	10% reduction in balanced environmental footprint	Greenfield offset 10 tonnes/year of total nitrogen  Pongamia pilot plantation reduces 1.4 tonnes/year environmental TN release
Progress of infrastructure to a ‘recycle and reuse’ approach	10% increase in sewage managed closer to the source	Explore Ugold for reducing nitrogen by treating at source
Deployment of innovative solutions that are addressing the impact of emerging contaminants, resource recovery and recycled water	10 proven technologies deployed	Ugold being explored for nutrient recovery (R&D phase)  Crop plantations for recycled water and nutrient uptake  Algae for resources recovery

# Sacramento Regional County Sanitation District, CA

## Energy Generation and Recovery



### Application Part 1: Background Information

Utility Name: Sacramento Regional County Sanitation District (Regional San)		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional Wastewater Treatment Plant (SRWTP) and Conveyance System		
Service Area (square miles): 250	Average Annual Daily Flow or Demand (MGD): 130	
Population Served: 1.4 million		
<b>Location</b>		
Street Address: 10060 Goethe Road		
City: Sacramento, CA	State:	Country: USA
Zip Code/Country Code: 95826		
<b>Utility Representative Contact Information</b>		
Name: Bernie Creelman	Phone: 916-876-6071	Email: creelmanb@sacsewer.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		

In what year did the utility achieve recognition as a Utility of the Future Today? 2016
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  X Activity Area 1: Beneficial Biosolids Use X Activity Area 2: Partnering & Engagement <sup>68</sup> X Activity Area 3: Energy Efficiency X Activity Area 4: Energy Generation & Recovery NO Activity Area 5: Nutrient Reduction & Materials Recovery <sup>69</sup> X Activity Area 6: Water Reuse X Activity Area 7: Watershed Stewardship <sup>70</sup> ( <input type="checkbox"/> IGP)

## Application Part 2: Organizational Culture

Sacramento Regional County Sanitation District (Regional San) first applied for Utility of the Future Today recognition in 2016 and was recognized in six of the seven key areas. That application process brought to light not only our many accomplishments, but also some unexplored opportunities for future success as well as the central role organizational culture plays in a utility of the future. Since then, Regional San has made substantial progress in creating a more vibrant and sustainable culture.

Culture begins with an agency’s strategic planning, vision, mission, and values as a roadmap of cultural evolution. In 2016 Regional San leaders created a 10-Year Strategic Plan, which included key goals that led to business initiatives to promote environmental sustainability and resource recovery; to foster a culture that makes Regional San a workplace of choice; to continue to protect the Sacramento River Watershed through holistic and sustainable approaches; and to enhance Regional San’s effectiveness and visibility through increased regional partnering and collaboration.

Central to the strategic plan effort, Regional San’s Mission Statement was updated to reflect a deeper commitment to resource recovery as well as cost-effective public health and environmental protection, replacing the previous focus of doing business in the most cost-effective manner possible. Our revised Vision includes being a trusted partner in environmental stewardship and regional sustainability. Later in 2016, Regional San’s executive management worked with employees from all its departments and offices to identify four core values critical to our business success:

- **Responsibility:** Accountable and Committed
- **Resolve:** Determined to Succeed
- **Proficiency:** Skilled and Capable
- **Environmental Stewardship:** Protect and Sustain

These four values were incorporated into the Regional San 10-Year Strategic Plan and have become integral to decision-making. The first three of these values pertain to our employees and to their commitment to the agency and community, their can-do attitude, and their commitment to continual learning, innovative thinking, and collaborative problem-solving. Employees are actively encouraged to

<sup>68</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>69</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>70</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

engage in discussions with their teams, direct reports, and supervisors on how these values are integrated into daily work, interactions, and decisions.

The fourth value represents Regional San's growing commitment to environmental stewardship and sustainability. Regional San's Policy & Planning staff are currently working with an environmental firm and internal and external stakeholders to develop an environmental sustainability policy and plan that will include high-level sustainability goals and directions, a transparent planning framework, specific performance measures, and benchmarking. The policy and plan will guide and direct many of Regional San's business efforts far into the future and will groom the environmental commitment with today's era of rapid environmental change.

Following are a sampling of Regional San's programs and efforts that reflect its commitment to being a Utility of the Future Today:

#### Workplace of Choice Business Initiative

This Business Initiative arose from the 2016 10-Year Strategic Plan. Staff is working with a workplace-culture consultant and collaborating with a large swath of staff to develop an extensive workplace culture survey to determine the strengths and weaknesses of the current workplace culture. From this information, the team will create an action plan and ultimately use the survey results as a baseline to measure progress.

#### Wellness Program

Although the Wellness Program has been active for several years, many new activities and programs have recently been added, including nutrition services, healthy food cooking demonstrations, and healthy-meals vending machines; personal exercise trainers, and stretch, exercise, and yoga classes; a new learning-to-run program; smoking-cessation counseling; and onsite body fat measurement and blood pressure machines.

#### Mentor/Mentee Program

This program is open to all employees who are interested in either mentoring an employee or being mentored by a senior staff member and affords all staff the opportunity to stretch, grow, and prepare for new challenges.

#### "Leadership Challenge" Training

"Leadership Challenge" is an intensive 2 ½ day training opportunity open to all interested employee. The Challenge teaches employees about effective leadership qualities. Class members are able to participate in a "360 Evaluation" leadership-practices inventory with their direct reports, peers, and supervisors. The survey results are shared with class members, and individualized coaching sessions are then arranged to assist staff with developing action plans in response to the survey results.

#### Succession Planning Efforts

Regional San recognizes that several key executive managers plan to retire in the near future. To prepare for this change, upper management has identified potential candidates within the organization who may want to interview for the vacancies and the employees below them who may want to move up in the organization. A rotation program was developed to allow these employees to gain embedment in other sections and departments and or exposure to greater levels of responsibility.

#### Going Green Environmental Education and Efforts Program

Created in mid-2016, the Going Green Program's impact on many of Regional San's business practices and culture has expanded. The Going Green team members once volunteered their time. Now,

management has authorized that each department provide four hours per week of team member support to this program. Going Green accomplishments include:

A complete redesign of Regional San's recycling programs

Creation of an organics recycling program for compliance with AB 1826 Organics Recycling Law

Yearly e-waste recycling events advertised to employees and local communities

A summer farmers' market, open to the public and hosted in the Goethe Road employee parking lot

Receipt of more than 30 employee recommendations for sustainability improvements, many implemented

Yearly clothing collection donated to homeless shelter and fire victims

Environmental education bulletin boards at each administrative location that reflect chosen environmental topics

Lunchtime environmental speaker and movie series

Green Energy Technology Academy (GETA) Partnership

This is a partnership with the Laguna Creek High School GETA class, involving:

Regional San staff presentations to the GETA class involving real-world problem-solving scenarios. Students work in small groups to solve a real wastewater treatment problem, come up with their solutions, and then come to Regional San to present their solutions.

Student internships in three Regional San business areas

Hosting mock interviews for graduating seniors

Regional San staff serving on the GETA advisory committee

Nicolaus Dairy Education Program

The Nicolaus Home and Dairy is a historic property located on Regional San's Bufferlands. Regional San's Board of Directors directed staff to renovate the farmhouse, dairy, chicken coop, workshop, and farm property and develop an education program that would be an asset to the community. Staff hired a full-time education consultant to develop a four-year elementary school field trip program with curricula units on California's historic dairies; a dirt-to-dinner explanation of the origin of our food; an overview of birds, both wild and farmed; and the necessity of pollinators. A robust program is being developed with community partners, volunteers, donations, work-based student learning opportunities, docents, indoor and outdoor exhibits, and standards-based curricula. The first field trips will be piloted in fall 2019.

Confluence Regional Partnership Program (Confluence)

Staff developed Confluence to bring together ideas and efforts that advance environmental, educational, and economic vitality in the Sacramento region. Through this program, Regional San is able to fund projects that help the community and advance Regional San's mission, vision, values, goals, and objectives. The program is funded through non-rate, non-fee revenues (not derived from ratepayer fees or rates). Confluence includes four funding categories: Environmental Stewardship Programs and Projects (projects that protect or enhance water quality of regional waterways and/or groundwater, watershed management efforts, and efforts to connect communities with failing septic systems to the Sacramento Area Sewer District collection system); Regional Economic Development Competitiveness Program (programs that support the economic vitality and job growth in the region through reducing sewer impact fees for qualifying commercial customers); Public Education and Career Awareness Programs

(educational programs and outreach to local elementary to university level schools, and employment and trade organizations, to advance awareness of the water cycle, sewage collection and treatment, and relevant careers); and the Sewer Lifeline Rate Assistance Program for low-income property owners.

#### Septic Conversion Program

Funded through Confluence and with state and county collaboration, this effort provides low-interest loans to property owners within Regional San's service area who are currently on septic systems and want to connect to the public sewer system. We are currently working with the community of Freeport, which for decades has wanted to connect to the public sewer system.

#### American River Taskforce Partnership

Areas of the American River Parkway are heavily impacted by trash and debris from illegal dumping and homeless encampments. With Confluence funding, Regional San has partnered with the American River Taskforce to fund clean-up efforts and a critical E-coli study that will identify the genetic origins of rising E-coli within the American River.

Becoming a Utility of the Future will help us continue to evolve to meet the needs of a constantly changing world. Regional San is proud of our environmental and long-term sustainability efforts, our current cultural transition goals, and commitment to being part of the future environmental sustainability solution.

### **Application Part 3: Activity Area - Energy Generation & Recovery**

Regional San has pursued a number of activities that promote (1) minimizing energy use, (2) generation of renewable energy and (3) resource recovery with an aim towards long-term sustainability.

In March 2019, Regional San has embarked on the development of a Sustainability Policy and Plan for the organization (18-month schedule). The vision for this program is to assess baseline conditions and then establish goals, objectives, actions and targets for the organization's future sustainability efforts. One focus area will include energy (use, generation and recovery). The focus in this area is important as Regional San is currently constructing the EchoWater Project, which will add nutrient removal and filtration to its current treatment processes. These additional treatment units will require extensive additional energy resources when they come online in 2023.

The projects highlighted below promote the goal of minimizing Regional San's carbon footprint while managing energy use.

#### SolarShares (minimizing the use of non-renewable energy)

The Sacramento Municipal Utility District (SMUD) SolarShares program allows large commercial users to offset a portion of their energy load with renewable energy from SMUD. Beginning in 2018, Regional San has committed to purchase 32.3 million kilowatt hours of clean renewable energy annually, over a twenty-year term. This represents about twenty-five percent of Regional San's total energy use.

#### Solar Project (generation of renewable energy)

In 2016, Regional San entered into a power purchase agreement with Tesla who constructed, owns, operates, and maintains a four megawatt solar array located the SRWTP. The project began operating in 2018 and Regional San purchases all of the electricity it generates, which is about 7.5 million kilowatt hours of clean renewable energy annually, for a twenty-five-year term. This represents about six percent of Regional San's total energy use.

#### Methane Gas to Energy (energy recovery)

One of the by-products of the solids treatment process is methane gas. Regional San captures methane in large digesters and it sent to SMUD who cleans and then uses the gas to generate renewable electricity.

**Biogas Enhancement Facility (energy recovery)**

Regional San and SMUD jointly constructed the biogas enhancement facility which came online in 2013. The facility enhances Regional San’s ability to covert fats, oils and grease into digester gas which results in additional energy recovery.

**Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph? While each program/project listed above has unique aspects, there are some common themes that led to successful implementation. First was robust communication with our governing Board to ensure that each effort had their full support from the beginning stages. This communication led to the next step of outreach with relevant stakeholders. The final piece is continual engagement of staff to promote cultural change within the organization. The goal is to encourage staff to embrace the organizational value of environmental stewardship. This is a continued effort to share a vision of harvesting resources and transforming facilities that can help mitigate climate change. Our Sustainability Policy and Plan will continue to align our organization toward environmental sustainability.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)  
 A great deal of support and commitment is needed to successfully implement these programs. Significant staff resources are needed at the administrative, engineering and operating levels of the organization. Financial resources in the form of grants and public/private partnerships (private partnerships to leverage tax incentives not directly available to a public agency) are also necessary.

Did you partner with other stakeholders or organizations as a part of your implementation process? Yes. Public and private partnerships.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that? Promoting cultural change in the organization to make the step to venture into these areas. Extensive strategic planning and employee engagement activities have occurred in the past few years. This led to Regional San’s sustainability effort currently underway.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe. No, but will likely be considered during our sustainability planning over the next 18-months.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented? [www.regionalsan.com](http://www.regionalsan.com)

**Performance Measures & Results:**

Measure What are you measuring?	Targets What was your goal/intended outcome?	Outcomes What were your actual outcomes?
Quantity of renewable energy generation.	TBD as part of Sustainability Effort.	Six percent of total energy use. Reduced carbon footprint.
Quantity of renewable energy commitment to energy portfolio.	TBD as part of Sustainability Effort.	Twenty five percent of total energy use. Reduced carbon footprint.
Quantity of biogas produced (recovered) from the solids process and sent to SMUD	TBD as part of Sustainability Effort.	Power generation for the equivalent of 5800 homes.

for renewable energy generation.		
Quantity of FOG material received and processed.	TBD as part of Sustainability Effort.	Enhanced biogas production.

# Sanitation Districts of Los Angeles County, CA

## Partnering and Engagement



### Application Part 1: Background Information

Utility Name: Sanitation Districts of Los Angeles County (Sanitation Districts)		
Type: Regional system with 11 wastewater treatment plants, 48 active pumping plants, and approximately 1,410 miles of sewers		
Service Area (square miles): 850	Average Annual Daily Flow or Demand (MGD): 400	
Population Served: 5.6 million		
<b>Location</b>		
Street Address: 1955 Workman Mill Rd.		
City: Whittier	State: CA	Country: United States of America
Zip Code/Country Code: 90601		
<b>Utility Representative Contact Information</b>		
Name: Wendy Wert	Phone: 562-908-4288, ext. 2308	Email: wwert@lacsdc.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		

Name:	Title:	Contact Information (phone or email):
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today?		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  <input checked="" type="checkbox"/> Activity Area 1: Beneficial Biosolids Use <input checked="" type="checkbox"/> Activity Area 2: Partnering & Engagement <sup>71</sup> <input checked="" type="checkbox"/> Activity Area 3: Energy Efficiency <input checked="" type="checkbox"/> Activity Area 4: Energy Generation & Recovery <input type="checkbox"/> Activity Area 5: Nutrient Reduction & Materials Recovery <sup>72</sup> <input checked="" type="checkbox"/> Activity Area 6: Water Reuse <input checked="" type="checkbox"/> Activity Area 7: Watershed Stewardship <sup>73</sup> ( <input type="checkbox"/> IGP)		

### Application Part 2: Organizational Culture

The Sanitation Districts of Los Angeles County (Sanitation Districts) protect public health and the environment through innovative and cost-effective wastewater and solid waste management and, in doing so, convert waste into resources such as recycled water, energy, and recycled materials.

The Sanitation Districts consist of 24 independent special districts serving about 5.6 million people in Los Angeles County. The service area covers approximately 850 square miles and encompasses 78 cities and unincorporated territory within the county. The agency also manages about one-fourth of Los Angeles County’s solid waste.

Seventeen of the Sanitation Districts in the metropolitan Los Angeles area are served by a regional, interconnected system of facilities known as the Joint Outfall System (JOS). The JOS consists of seven wastewater treatment plants. Six upstream water reclamation plants (WRPs) capture low salinity, high-quality wastewater and produce a drought-resistant water resource: disinfected recycled water that is ready to use in a variety of applications without further treatment. Downstream, the JWPCP treats two-thirds of the wastewater in the JOS along with the solids removed at the upstream plants.

The Sanitation Districts manage separate wastewater systems in the Santa Clarita Valley and the Antelope Valley. Each of these valleys is home to two WRPs that provide important sources of water for wildlife habitats and for municipal and agricultural reuse.

#### Organizational Culture

By keeping open communication between managers and employees, maintaining employee engagement and morale, providing employee training, and fostering efficiency and innovation, the Sanitation Districts are building a sustainable workplace culture focused on converting waste into resources.

Management builds a collaborative environment by being accessible to employees and providing different avenues to provide feedback and express concerns. Employees have the opportunity to participate in agency-wide workforce surveys, which are used to determine possible areas for improvement. A

<sup>71</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>72</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>73</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

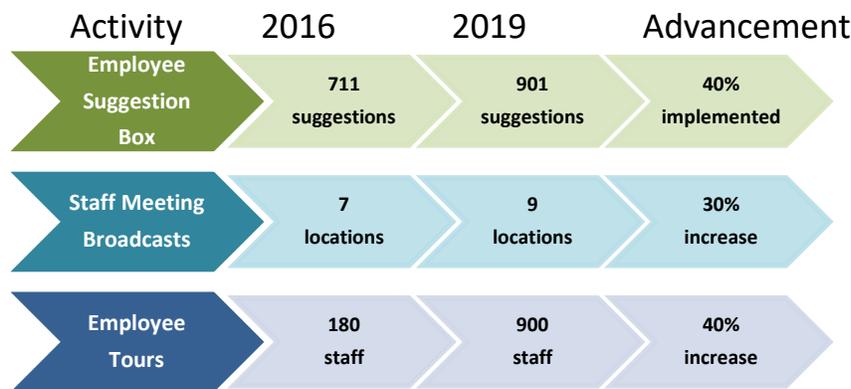
suggestion box is available to all employees. Management reviews and responds to each suggestion. Improvements to the agency, as a result of employee suggestions, include installation of drought-tolerant landscaping, installation of a pipe display garden that includes outdoor employee training areas, substitution of fleet vehicles with clean energy alternatives such as electric vehicles used for the employee rideshare program, replacement of bottled drinking water coolers with more sustainable filtered water stations. Recent accomplishments include implementation of a cafeteria food waste diversion program, and implementation of a food waste to green energy program, which currently generates one megawatt of electricity.

To continually improve agency performance, every department and section sets annual goals. Status updates for each goal are posted and available to each employee. A new employee performance review system has been implemented agencywide. The system focuses on continual improvement by identifying goals and career development opportunities for employees and includes an employee input section.

A formal management/supervisor training program was established to ensure Sanitation Districts' leadership maintains the skills needed to be as effective as possible. All staff has been given a subscription to the complete library of Fred Pryor online training courses and a basic two-year curriculum has been established that covers issues like communications, interpersonal skills and project management.

The agency aims to be transparent and keeps employees engaged through presentations and widely distributed publications. Monthly staff presentations and lunchtime talks are held on various topics such as updates on ongoing projects, future outlooks of various facilities and overviews of different sections' roles in the agency. The presentations are broadcast to remote facilities to allow off-site employees to participate.

#### Organizational Culture Advancements



The intranet provides a centralized location to publish documents easily accessible to staff. These include monthly reports that track the progress of individual projects in design, plant monitoring reports, biosolids and water reuse summaries, departmental goals, media articles related to the Sanitation Districts and the Pipeline, a bimonthly newsletter, written by the employees for the employees. The Pipeline includes articles regarding recent projects, personal and professional accomplishments, an article written by management addressing agency developments, and acknowledgment of employees recognized through the Excelsior employee excellence program.

Many training opportunities are available to staff at various levels and classifications. An internship program has been established with local community colleges and trade schools to provide students with treatment plant operation experience. The Sanitation Districts also works with community colleges to establish learning programs that are aligned with skills required to be a treatment plant operator. Employees in several classifications receive a yearly professional development stipend for relevant books,

organization dues, courses and conference fees. Employees are encouraged to participate in other professional development activities such as taking leadership roles in professional organizations and participating in a Toastmasters Club to improve public speaking skills.

Agency efficiency and innovation are fostered through programs such as the asset management system and the work of the Wastewater Research Section. A computerized enterprise asset management system has been implemented at all operational facilities. This system facilitates an extensive preventative maintenance program that minimizes reactive maintenance and the associated unplanned downtime. The system provides a variety of other benefits including the more efficient scheduling of work crews, accurate tracking of equipment life-cycle costs, and the diagnosis of equipment problems through review of equipment work histories. A group of wastewater research engineers and support staff assess ways to optimize existing processes and evaluate new technologies to that may enhance the cost-effectiveness of the Sanitation Districts' wastewater management efforts. Examples include developing sequential chlorination for tertiary recycled water disinfection, testing the feasibility of food waste co-digestion at the JWPCP, and partnering with the Metropolitan Water District of Southern California (MWD) on a potential Regional Recycled Water Program (RRWP) that could become the largest water recycling project in the country. Efforts included bench- and pilot-scale testing of advanced treatment processes. A 500,000 gallon-per-day demonstration facility is nearly complete, and the Sanitation Districts and MWD have developed an extensive testing program to evaluate the effectiveness of the proposed treatment train, which includes the novel use of a membrane bioreactor prior to reverse osmosis treatment. This demonstration facility will generate information needed for design and permitting of a potential full-scale advanced water purification facility.

**Activities:**

Activity Description	Activities completed or underway
Increase agency improvement programs through employee suggestion box	
Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation.	
901 suggestions have been received since December 2010 (about 105 per year). Suggestions have increased by 27% since 2016. Roughly 40% of the suggestions have led to a change being implemented.	
Current events and lunchtime presentations: In 2018, 19 presentations were made by staff to staff. Each presentation was broadcast to up to 9 remote facilities. The presentations are also recorded and available to employees for individual viewing.	

**Performance Measures & Results:**

Parameter Measured	Activity Advancements	Outcomes
Leadership and Training	Workforce Survey , typically conducted every 2 years	<p>Employee interaction and communication with leadership is more robust. Management solicits input from staff on various items such as topics to be addressed in the annual State of the Sanitation Districts meeting.</p> <p>In 2017 the managers and supervisors online training program was expanded to include all staff. New supervisors receive training after promotion.</p>

Parameter Measured	Activity Advancements	Outcomes
		<p>An employee liaison advocates for employees. Liaison works directly with the Assistant Chief Engineer to ensure concerns are resolved.</p> <p>Tours of Sanitation Districts’ facilities are available to all employees to maintain employee engagement. Typically at least 3 facility tours per year are made available to all employees.</p>
Agency Efficiency	Asset management program	<p>Since 2016, the Sanitation Districts have been implementing a Predictive Maintenance Master Plan for each Section of the Wastewater Management Department involved in operations.</p> <p>Predictive maintenance involves determination of the maintenance frequency based on actual data, rather than a fixed interval (preventative maintenance). This approach is expected to be more cost-effective.</p> <p>In addition, a Structural Condition Monitoring Program was developed and implemented to prioritize the rehabilitation of major concrete structures within the wastewater treatment plants. During the last few years, the WCS Section has inspected and completed condition ratings on virtually all of the Sanitation Districts’ collection system.</p> <p>Last, a capital expenditures (CapEx) to operating expenses (OpEx) pilot program was conducted a few years ago on a major capital project with great success, which resulted in many benefits to the Sanitation Districts’ Asset Management Program. Consequently, the CapEx to OpEx program was implemented full scale and is applied to all Sanitation Districts’ capital projects.</p>

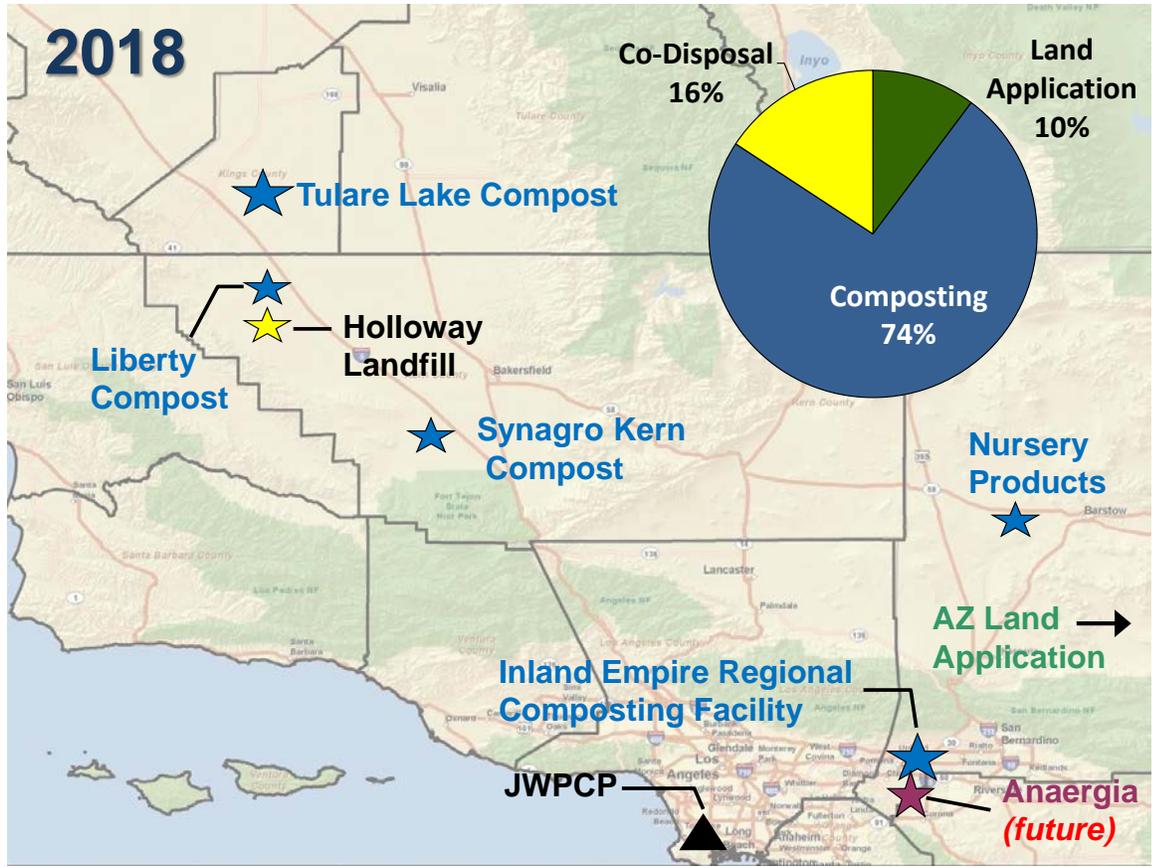
**Application Part 3: Activity Area - Partnering & Engagement**

(Please note: The applicant included information on other Activity Areas which is not relevant to this application, the text of which has been grayed out)

Activity Area 1: Beneficial Biosolids use

The Sanitation Districts’ Biosolids Management Program seeks to employ safe, diverse, reliable, long-term, and cost-effective biosolids management options. Approximately 85% of the biosolids are managed through sustainable options, such as composting and land application, and the Sanitation Districts continue to evaluate innovative management options such as biosolids-to-fuel facilities. The Sanitation Districts have developed two composting facilities, one in Rancho Cucamonga, CA and the other near Kettleman City, CA that can be expanded to process the full amount of biosolids produced by the Sanitation Districts.

SANITATION DISTRICTS BIOSOLIDS PORTFOLIO



Activities:

Activity Description	Activities completed or underway
The Sanitation Districts' biosolids management strategy supports the development of emerging technologies.	
The Sanitation Districts currently have one contract for the development of an innovative biosolids processing facility with enhanced energy recovery.	



**Performance Measures & Results:**

Parameter Measured	Activity Advancements	Outcomes
Cost effective	Request for proposal in Biocycle US Composting Council	Saved \$600k Established new contracts for 4 WWTPs. Shorted to 3-year contracts, increasing program agility.
Biosolids beneficially reused 2018	Current events and lunchtime presentations	84% of the over 482,400 wet tons produced was beneficially reused 74% composted and 10% land applied
Sustainability	Compressed natural gas-fueled vehicles	The Sanitation Districts utilizes compressed natural gas-fueled vehicles for a portion of its contracted hauling.  Compressed natural-gas vehicles provides air quality benefits, such as reduced air and greenhouse gas emissions as compared to diesel-fueled vehicles.

**Activity Area 2: Partnering & Engagement**

The Sanitation Districts sponsor many educational opportunities including our marine biology harbor tours and in-class microorganism and water quality science labs. We promote and practice environmental sustainability through community partnering and engagement programs. We actively collaborate with community organizations, including nonprofit groups, professional associations, educational institutions and other public agencies. We provide environmental education materials, teacher resources and classroom presentations throughout Southern California on the importance of water quality, conservation, and sustainability to students from Kindergarten through College.

The Sanitation Districts have completed extensive outreach related to a large capital project, called the Clearwater Project, which will protect local waterways by addressing aging infrastructure. Over 500 community meetings were held during the planning phase and community outreach will continue during the seven years of construction.

**Community Partnering & Engagement Advancements**



For the last 13 years, the Sanitation Districts have hosted an annual Earth Day celebration at our office in Whittier that draws approximately 2,500 visitors. This family-friendly fair is a great opportunity for the

local community to learn more about the Sanitation Districts and environmentally sustainable practices through tours of our facilities and by visiting over 50 exhibitor booths.

**Activities:**

Activity Description	Activities completed or underway
In partnership with LA County, the Sanitation Districts run a Household Hazardous Waste and Electronic Waste Collection Program (HHW) that provides Los Angeles County residents with a legal and free way to dispose of unwanted HHW.	
The JWPCP Citizens' Advisory Committee (CAC) was formed in 1978 to provide a forum for community input regarding the Sanitation Districts' operations. The CAC meets quarterly and is responsible for many improvements at the JWPCP, including odor reductions and perimeter landscaping.	
The Sanitation Districts is a sponsor of the Environmental Engineers of the Future scholarship program, which offers funding for students. Since the start of the program in 2005, approximately \$1.2 Million have been provided to students obtaining a Master's Degree in Environmental Engineering.	

**Performance Measures & Results:**

Parameter Measured	Activity Advancements	Outcomes
Develop Community Resources	Expanded partnership with MWD	<p>\$2.3 million restoration of Bixby Marshland, a 17-acre marsh, located at our largest treatment facility, the JWPCP</p> <p>We own and operate the marshland, which is open to the public the first Saturday of the month with docents' available onsite to provide tours.</p> <p>2,600 more students will visit the marshland due to expanded partnership with MWD.</p>
Sustainability	Compressed natural gas-fueled vehicles	<p>The Sanitation Districts utilizes compressed natural gas-fueled vehicles for a portion of its contracted hauling.</p> <p>Hauling with compressed natural-gas vehicles provides air quality benefits, such as reduced air and greenhouse gas emissions compared to hauling with diesel-fueled vehicles.</p>
Environmental Education	Reaching more students and schools in our service area	In partnership with the Youth Science Center, we provides students with hands-on application of science, as they make, clean, and test simulated wastewater.

Activity Area 3: Energy Efficiency

The Sanitation Districts started an Energy Efficiency Management Program in 2006 to maximize energy savings through capital improvement projects, rebate incentives, operational optimization, billing rate optimization, and billing error corrections. Our energy efficiency measures have resulted in \$6.3 million in savings for fiscal year 2017-18 and \$52 million in savings since the program's inception.

We are also committed to reducing fossil fuel usage and promoting alternative fuel vehicles. We are currently working on a recommendation to convert all our solid waste hauling vehicles to compressed natural gas vehicles. Approximately 377 employees participate in a rideshare program that provides incentives to encourage carpooling, riding bikes and driving alternative fuel vehicles. The Sanitation

Districts currently have 72 natural gas and 23 electric vehicles in the fleet and are continuing to increase the percentage of alternative fuel fleet vehicles. Three natural gas fueling stations and two electric vehicle charging stations are located at our facilities and are open for public use.

Activity Area 4: Energy Generation & Recovery

The Sanitation Districts operate a combined cycle combustion turbine facility at the JWPCP that generates approximately 20 MW of electricity for on-site use as well as steam for the plant’s anaerobic digesters, making the JWPCP virtually energy self-sufficient. During periods of low plant power demand, excess power is exported to the power grid.

Under a partnership with Waste Management, Inc. (WM), the Sanitation Districts started a food waste recycling demonstration project in early 2014. With this project, food waste was accepted and processed into a slurry at WM’s materials recovery facility, transported to the JWPCP, and converted into biogas using existing digesters. After three years, this project successfully recycled more than 50,000 tons of food waste. The demonstration project provided the Sanitation Districts with valuable information toward implementing a full-scale project and provided a road map for other entities interested in organics recycling.

With the success of the demonstration project, the Sanitation Districts began implementing a full-scale food waste to energy program in early 2018. The Sanitation Districts are using primarily existing facilities to convert food waste into one megawatt of electricity, which is enough to power 1,000 homes. By the end of 2020, the Sanitation Districts will install equipment that will convert biogas into fuel to power vehicles (equivalent to 2,500 gallons of gasoline per day).

Activities:

Activity Description	Activities completed or underway
The JWPCP operates a digester gas-fueled, gas turbine-based combined cycle power plant that provides 100% of the plant’s electrical energy and process heating requirements under normal conditions.	
We have implemented a food waste recycling project at the JWPCP. The addition of food waste has resulted in an increase of digester gas production and has generated an additional 1 megawatt of electricity by the JWPCP combined cycle power plant.	
Digester-gas fueled boilers at Palmdale, Lancaster and Valencia WRPs, and JWPCP supply heat for respective anaerobic digesters.	

**Performance Measures & Results:**

Parameter Measured	Activity Advancements	Outcomes
Power generation	Digester gas augmentation	Average 16.3 MW for FY 2017-2018 Power generated from digester gas and used on-site at JWPCP
Sustainability	Efficient use of resources	Electricity purchases avoided by generating power on-site \$15.6 million for FY 2017-2018

Activity Area 6: Water Reuse

The Sanitation Districts are one of the top producers of recycled water in the nation and remain strong proponents of expanding use of recycled water. Annually, over 100,000 acre-feet of tertiary treated recycled water is produced by our WRPs and used at more than 900 sites throughout LA County. More

than half of the recycled water is used to replenish local groundwater supply. The remainder is distributed for landscape irrigation, agriculture, and industrial processes. The WRPs utilize recycled water for on-site irrigation, wash-down, pump cooling, chemical mixing, and toilet flushing. Since the Sanitation Districts began recycling water in 1962, over 1 trillion gallons have been beneficially reused.

The Groundwater Reliability Improvement Program, a project led by the Water Replenishment District of Southern California and supported by the Sanitation Districts, provides advanced treatment for 10,000 acre-feet per year of Sanitation Districts recycled water. This purified water is used to replenish groundwater and has a lower blending water requirement compared to other groundwater replenishment activities. This program has the potential to expand an additional 10,000 acre-feet per year.

As mentioned previously, the Sanitation Districts and MWD have partnered on a potential Regional Recycled Water Program that could become the largest water recycling project in the country. At full scale, the project could produce up to 150 million gallons of purified water each day, enough to serve more than 500,000 homes. This water would be used to replenish groundwater basins and provide greater water supply reliability for Los Angeles and Orange counties.

**Activities:**

Activity Description	Activities completed or underway
For nearly 60 years, recycled water produced by the Sanitation Districts has been reused for a wide range of applications including groundwater replenishment, landscape irrigation, agricultural irrigation, cooling towers, industrial processes (carpet dyeing, metal finishing), environmental enhancement, and construction applications (e.g., dust control, soil compaction, concrete mixing).	
A flow equalization tank is being constructed and will be completed in 2020 at the San Jose Creek Water Reclamation Plant (WRP) to increase the available amount of recycled water for reuse. There is a large demand for recycled water during the night, when production is lowest, and the flow equalization tank will enable more recycled water to be provided during the high demand periods.	
The Sanitation Districts are partnering with MWD on a potential Regional Recycled Water Program that could produce 150 MGD of purified water for groundwater replenishment. Construction of a demonstration facility is nearing completion. This project would make the high-salinity water at the JWPCP reusable.	
Recycled water is used at all WRPs for irrigation, wash-down, pump cooling, chemical mixing, and toilet flushing. Site supervisor training program is provided to ensure proper use of recycled water.	
The Sanitation Districts have provided engineering reports to the local regulatory authorities to support expanded distribution systems and the agency supports legislation promoting water recycling (e.g., approval of recycled water hose bibs at cemeteries).	

**Performance Measures & Results:**

Parameter Measured	Activity Advancements	Outcomes
Increase in recycled water used	from base year FY 1994-1995 through FY 2017-2018	Reuse sites increased by 177% (324 to 896) Volume of recycled water used increased by 95% (53,890 to 104,996 acre-feet per year)

Parameter Measured	Activity Advancements	Outcomes
		<p>Percent of available recycled water beneficially reuse increased from 25.4% to 69.3%</p> <p>Acreage irrigated with recycled water increased by 104% (from 7,873 to 16,052 acres)</p>
Environmental Benefits	for FY 2017-2018	<p>Avoided energy usage of 315 million Kwh (3,000 kWh/AF for pumping imported water over Tehachapi Mountains)</p> <p>Avoided greenhouse gas production of approximately 236,000 tons of carbon dioxide</p> <p>Avoided air pollutant production of 181.1 tons of nitrogen oxide, 31.5 tons of carbon monoxide, 18.9 tons of sulfur oxides, 6.3 tons of particulates, and 1.6 tons of reactive organic gases</p>
Sustainability	Water supply benefits	<p>Augmentation of supply with recycled water equivalent to the needs of 525,000 people</p> <p>Imported water for seawater intrusion barrier replaced with advanced treated recycled water (moving to 100% recycled)</p> <p>Local potable water for oil-zone re-pressurization replaced with recycled water</p> <p>60,000 acre-feet per year of recycled water used for groundwater recharge since 1962</p>

Activity Area 7: watershed stewardship

In 2016, the Sanitation Districts was given the authority to help manage and treat stormwater (including dry weather flows) in Los Angeles County. Our first project under this new authority is nearing completion. This project in Carson, CA will divert stormwater to a new storage facility then to JWPCP for treatment. The project will reduce discharge of bacteria, nutrients, and other pollutants to the local waterways.

# Spokane County Environmental Services Department, WA

## Watershed Stewardship



### Application Part 1: Background Information

Utility Name: Spokane County Environmental Services Department (SCES)		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): multiple water resource recovery facilities, sewer collection system, regional wastewater system, regional solid waste system, rural water supply utility.		
Service Area (square miles): 1781 sq. mile (entire county), 60 sq. mi. sewer service area	Average Annual Daily Flow or Demand (MGD): 9.1 MGD	
Population Served: 123,000		
Location		
Street Address: 1026 W Broadway Ave		
City: Spokane	State: WA	Country: USA
Zip Code/Country Code: 99260		
Utility Representative Contact Information		
Name: Toni Taylor	Phone: 509.477.7577	Email: TNTAYLOR@spokanecounty.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today?

2018

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- (in 2018) Activity Area 2: Partnering & Engagement<sup>74</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>75</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>76</sup> ( IGP)

## Application Part 2: Organizational Culture

As a recipient of the Utility of the Future Today recognition in 2018, Spokane County Environmental Services is applying for additional recognition under Activity Area 7: Watershed Stewardship in 2019.

## Application Part 3: Activity Area - Watershed Stewardship

### Overview Paragraph:

Spokane County Environmental Services Department was envisioned and founded in the early 1980s as a steward of the Spokane River watershed. Spokane County Environmental Services began as an organization to protect the EPA designated Spokane Valley – Rathdrum Prairie Sole Source Aquifer (SVRP Aquifer) from contamination. The SVRP Aquifer provides the sole source of drinking water to over 500,000 residents in Idaho and Washington. In recent decades, Spokane County Environmental Services has taken on new tasks, such as rural water banking and solid waste management, across a larger area, but all with the focus of protecting surface and groundwater in the Spokane River watershed. Specific watershed stewardship activities include:

### Regional Water Quality and Quantity

**Groundwater quality monitoring:** For over 30 years, Spokane County has conducted quarterly sampling from over 40 wells across the SVRP Aquifer. The monitoring program is to track regional water quality with the goal of detecting and preventing further degradation due to urban development.

**Water banking:** In response to a 2016 state Supreme Court decision limiting the availability of water for rural development in the region, Spokane County created a water bank to support new water use in a closed river basin. The water bank allowed new water uses to be established without impacting stream flow in the Little Spokane River watershed.

**Streamflow restoration:** Spokane County is leading a tri-county effort under the state Streamflow Restoration Act to increase baseflow during summer months in the Little Spokane River watershed. This program helps to improve the balance between senior water rights, habitat, and future water use.

<sup>74</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>75</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>76</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

**Wetland restoration:** Spokane County has acquired nearly 600 acres of a former lake bottom known as Saltese Flats and is restoring wetlands using natural water. The wetland is a potential site for future beneficial use of reclaimed water, but until that is necessary, it will be restored for wildlife habitat, groundwater recharge, public access and education, and recreation.

**Climate resilience:** Spokane County developed an integrated ground and surface water model for the Little Spokane River watershed to investigate human water use and climate change impacts on streamflow. This model is used to evaluate, for example, where potential projects such as managed aquifer recharge, wetland restoration, and alluvial water storage can benefit streamflow during low flow periods.

**Watershed planning activities:** For over 20 years, Spokane County has led Spokane River watershed planning activities. The activities have resulted in plans supporting water conservation, water storage, water quality improvements, and better understanding of geographic water availability.

**Idaho-Washington Aquifer Collaborative (IWAC):** Spokane County is an active member of IWAC, made up largely of regional municipal water purveyors. The purpose of IWAC is to work together, across the Idaho-Washington state line, to maintain and/or enhance water quality and quantity for present and future generations by developing management strategies which benefit the Spokane Valley Rathdrum Prairie Aquifer.

**Water Resource Center and public education:** Spokane County operates a Water Resource Center to provide public education on watershed stewardship. Coupled with the Center, Spokane County also provides off-site education programs to school groups in the community. In recent years, Spokane County has provided watershed education to approximately 125 groups per year.

**Regional landfill closure:** Closed landfills represent an important threat to Spokane County surface and groundwater resources. Spokane County is the managing entity for three closed landfill sites, capturing and treating contaminated groundwater, and leachate and ensuring that the landfill caps are functional to prevent migration of contaminants through extensive groundwater monitoring and residential well monitoring.

**Household hazardous waste disposal:** Household Hazardous Waste (HHW) can be dropped off free of charge at the Spokane County Regional Solid Waste Disposal sites on weekends. This service helps our residents properly dispose of wastes to help protect regional water quality.

**Proper Materials Disposal Education and Outreach:** Spokane County Regional Solid Waste System partners with member jurisdictions, the City of Spokane, the Spokane Regional Health District, Spokane Waste Directory, and other agencies to educate our community on proper disposal of wastes and toxics. The outreach is performed a variety of ways including events, school presentations, higher education workshops, social media, and other outlets.

## **Wastewater Collection and Treatment**

**Membrane bioreactor treatment:** In 2011, Spokane County, with its contract operator Jacobs, turned on a brand new membrane bioreactor to treat 8 million gallons per day of separate sanitary sewer. This facility was the result of a decade long planning effort to treat wastewater to 50 parts per billion (0.050 mg/L) total phosphorus prior to discharge to the Spokane River. This phosphorus limit is one of the most stringent in the country and represents an important stepping stone in regional surface water quality improvements.

**Inter-utility sewer planning:** Spokane County works closely with its neighboring wastewater utilities, the City of Spokane and the Liberty Lake Sewer and Water District, to best serve the residents of our region. This coordination includes service area boundary determination and water resource recovery

facility capacities impacts that can be balanced to meet customer and water resource needs. Spokane County also owns, and funds approximately 23% of the wastewater capacity at the City of Spokane's 44 MDG water resource recovery facility.

**Regional Toxics Task Force:** Spokane County was a founding member in 2012 and continues to participate in a watershed based, bi-state approach to address polychlorinated biphenyl (PCB) pollution. The Spokane River Regional Toxics Task Force involves state and local government agencies and environmental groups, who in 2016 developed a comprehensive plan to reduce PCBs in the Spokane River and is now implementing that plan.

**Sewer and Road improvement Partnerships:** Spokane County works closely with the City of Spokane Valley to combine County sanitary sewer projects with City road improvement projects. These important road upgrades have been timed to allow sewer line extension to newly developing areas, enhancing business development opportunities, while protecting the important groundwater supply under our community.

**Coalition for Clean Water:** Spokane County joins 11 municipalities and special purpose districts in Washington as an active member in the Coalition, representing the largest wastewater and stormwater utilities in the state. Coalition members fund the operating budget of approximately \$100K per year, including a full-time executive director. It was formed by an Interlocal agreement in 1985 to address issues of preservation and improvement of water quality, as well as the reduction of pollution and the planning and financing of necessary facilities.

### **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Spokane County Environmental Services was founded in the 1980s as a steward of the Spokane River watershed. Our mission was clear from the beginning, prevent further degradation of our regional groundwater supply caused by urban development. To that end, Environmental Services has constructed hundreds of miles of sanitary sewer and eliminated over 30,000 septic systems. Since that beginning, our activity areas have broadened, to include regional water quality and quantity concerns but always remained focused on the mission of protecting human health and the environment.

An important part of implementing watershed activities is the recognition that the watershed issues cross government jurisdictional boundaries such as state lines and city limits. Spokane County has worked for decades with the City of Spokane, and more recently with the newly incorporated cities of Spokane Valley and Liberty Lake to ensure that all concerns can be heard and ideally solved through partnerships.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

Spokane County Environmental Services has a staff of 70 and an annual budget of approximately \$130 million.

Development of the County's sanitary sewer collection system is supported by multiple funding sources:

Grant funding from the State of Washington Centennial Clean Water Fund of \$5M per year for 20 years;

Voter approved annual fees assessed on property owners receiving drinking water from and/or with a septic system discharging to the SVRP aquifer and associated drainage area; and

Sewer connection fees funding the sewer system.

Spokane County sewer rates include a monthly wastewater treatment plan charge to help cover capital construction costs of the County's 8 MDG MBR facility plus the County portion of the City of Spokane water resource recovery facility.

County Water Programs including water reclamation and water resources included ten staff. Within those ten, watershed planning efforts were funded largely by state grants and require approximately one to two full time employees.

Wastewater Operations, overseeing sewer collection, pump stations, and two small treatment facilities has a staff of 22. The majority of these 22 staff are certified as Washington Wastewater Collection Personnel Association Wastewater Collection Specialists or Washington State Water Pollution Control Operators.

Regional Solid Waste Coordination and Landfill Closure group has 7 staff working on a variety of programs such as groundwater monitoring and public education.

The Sewer Design, Code Enforcement, and Billing Management has a combined 25 staff, providing customer service for accounts, permitting, plan review, and construction inspection.

Did you partner with other stakeholders or organizations as a part of your implementation process?

Partnerships have been a keystone in Spokane County Environmental Services activities. These partnerships have included both work between Idaho and Washington, neighboring counties, various cities in our region, State and Federal agencies, Tribal governments and a multitude of stakeholder groups ranging from business interests to environmental advocates. These partnerships include Spokane County's public education programs to inform our community of on-going watershed challenges. There is a recognition in our region that the Spokane River, the SVRP Aquifer, and our watershed are all linked to our communities' health and prosperity.

A current collaboration focus is Spokane River Regional Toxics Task Forces, which aims to reduce PCB contamination in the Spokane River. Members include Spokane County along with other local, state, and federal government agencies, and non-profit environmental organizations.

An additional example of an on-going partnership is at the County's nearly 600-acre wetland restoration project at Saltese Flats. The County has partnered with Ducks Unlimited (DU) on the project and has received several benefits including Ducks Unlimited funding the acquisition of a 60-acre neighboring property for County ownership, and a likely soon-to-be-funded grant application of over \$400,000 to DU for restoration on County and neighboring private property.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

A critical obstacle for Spokane County Environmental Services has been managing the complexity of water resource issues. There is general regional recognition of the importance of water quality and quantity topics in our community, but the breadth of detail and connections is extensive. Unfortunately, no single organization can solve the variety of problems, but through open communication and partnerships we can work with other agencies to resolve challenging issues. Spokane County has used partnerships to allow various specialists to work on the projects that suit them best.

Has "smart" information technology supported your implementation/optimization in this area? If yes, please describe.

"Smart" information technology has been useful to Spokane County because it allows us to collect new data, gather existing data, and synthesize its presentation to the community. For example, for one project, Spokane County collected new groundwater data in a complex aquifer systems, coupled that with existing groundwater nitrate data from a well drilling database, and combine and present it in a web-map view

software. This publicly available software presentation allows residents to examine the aquifer system to better understand where and what water quality is in portions of the county.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Spokane County Environmental Services website, [www.spokanecounty.org/es](http://www.spokanecounty.org/es), provides information on sewer collection, wastewater treatment, water resources, proper materials disposal, and landfill closure. Specific questions can be directed to Toni Taylor, [tantaylor@spokanecounty.org](mailto:tantaylor@spokanecounty.org)

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Water required to offset new domestic self-supplied water use over a 20 year planning horizon.	Approximately 1600 acre-feet of water offset from a combination of water rights retirement, and streamflow restoration projects	Currently Spokane County owns 283 acre-feet and has received grants to acquire up to 341 additional acre-feet.
Wetland restoration – Saltese Flats	515 acres for wetland restoration	587 acres (exceeded target because partners provide additional land acquisition)
Phosphorus removal at Water Reclamation Facility	Removal of 99% of the total phosphorus in the wastewater influent prior to discharge	Actual removal of over 99% of total phosphorus prior to effluent discharge
Polychlorinated Biphenyls in the water resource recovery facility influent and effluent	Statistically significant reduction in influent PCB concentrations.	Actual removal of over 99% of PCBs prior to effluent discharge
Collection of household hazardous waste diverted from the waste stream through free residential drop off at the designated Regional Solid Waste Facilities	Our target is to increase volumes every year through outreach and education.	Materials collected and diverted from waste streams average between 450,000 lbs to 550,000 lbs per year since 2015.
Water resource education events (cumulative number of events per year)	Goal of 150 education events per year	Total events of approximately 125 per year

# Toho Water Authority – Kissimmee, FL

## Water Reuse



### Application Part 1: Background Information

Utility Name: Toho Water Authority	
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional System- including potable water, water reclamation, and reclaimed water systems	
Service Area (square miles): Approximately 195	Average Annual Daily Flow or Demand (MGD): 35
Population Served: 322,900	
<b>Location</b>	
Street Address: 951 Martin Luther King Boulevard	
City: Kissimmee State: Florida	Country: United States
Zip Code/Country Code: 34741	
<b>Utility Representative Contact Information</b>	
Name: Michael Sweeney	Phone: 407-944-5129      Email: msweeney@tohowater.com
<b>If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below</b>	
Name:	Title:                      Contact Information (phone or email):

**Current Program Members Only**

In what year did the utility achieve recognition as a Utility of the Future Today? 2018

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

Activity Area 1: Beneficial Biosolids Use

Activity Area 2: Partnering & Engagement<sup>1</sup>

Activity Area 3: Energy Efficiency

Activity Area 4: Energy Generation & Recovery

Activity Area 5: Nutrient Reduction & Materials Recovery<sup>2</sup>

**Application Part 3: Activity Area - Water Reuse**

As a water utility in the state of Florida, we recognize the critical importance water reuse has on our present and future need to manage potable water demand. On a national scale, Florida ranks #1 in reuse flow per capita with a reported reuse per capita of 36 gpd/person. According to the latest Florida Department of Environmental Protection (FDEP) Reuse Inventory Report, Osceola County (Toho Water Authority’s service area) ranks #5 in the state for per capita reuse flow for a county population ranked 19th in the state. Incidentally, California comes in #2 place with a reported reuse per capita of 16 gpd/person (<https://floridadep.gov/water/domestic-wastewater/content/reuse-inventory-database-and-annual-report>).

**Overview**

Toho Water Authority (TWA) operates eight water reclamation facilities in Osceola County with a total permitted capacity of over 32.8 million gallons per day (MGD). Toho treats wastewater to public reuse standards and discharge approximately 24.3 mgd to the communities we serve. Over 435 miles of distribution pipe comprise our reclaimed water distribution system. Our reclaimed water is used in various settings: serving 19,000 residential and commercial customers, several golf courses and providing cooling water for two local power plants (KUA and Florida Power). In addition to our reclaimed water distribution system, our facilities have designated wet weather storage for those times of the year when demand for reclaimed water is reduced. Finally, we also have the option to vary discharge rates to rapid infiltration basins (RIBs) for groundwater recharge.

**Leading by Example**

In 2010, the Toho Water Authority Administration Building was built to meet the LEED gold certification standards. As part of the sustainability features of the building, it relies on reclaimed water to flush toilets throughout the 54,000 ft<sup>2</sup> building. Outside landscaping is native to Florida and requires no irrigation. The Authority is very active in various initiatives centered on water reuse. Mike Sweeney, our Deputy Executive Director, holds a seat on the Board of Directors of the WateReuse Florida association. This nonprofit organization was formed to educate the public on water reuse issues and advocate for funding to increase water reuse in Florida. Brian Wheeler, recently retired Executive Director of the Authority, helped found and retains the Vice-Chairmanship of the Potable Reuse Commission. The commission has been tasked with developing a framework for the implementation of indirect and direct potable water reuse in Florida. A public outreach program is also being developed.

**Expanding the Reuse Water Distribution Area**

Toho Water Authority has several projects underway to switch over communities that are currently relying on potable water to meet their irrigation needs and provide them with reclaimed water. In addition, Toho requires developers to install both water and reclaim lines as part of new construction. While this requirement presents a higher cost to the developer/builder, it impacts them all equally and allows us to get communities on reclaimed water for their irrigation needs from the start and meet our goal of saving approximately 1.3 million gallons per day of potable water. The requirement saves time, cost and inconvenience in the long run.

### **Groundwater Recharge**

When the supply of reclaimed water exceeds the demand for it, our facilities discharge the treated effluent to a network of rapid infiltration basins (RIBs). The RIBs are permeable basins designed and maintained to allow treated wastewater to percolate through layers of sand until it eventually recharges the groundwater aquifer.

### **One Water Community Emergence**

In 2018, Toho developed and executed a comprehensive service agreement with the Tavistock Group to serve Sunbridge- a large new 24,000 acre master planned community in the northeast region of Toho's service area. One of the distinguishing features of Sunbridge is that it will be developed as a One Water Community. An one water approach aspires to incorporate all water—drinking water, wastewater, stormwater,—as water resources originating onsite to serve that specific community. In order to meet these goals, the use of automatic meter reading, natural system landscaping, and potentially indirect and/or direct potable reuse will be employed.

### **Indirect Potable Reuse Projects**

Toho is investigating Indirect Potable Reuse (IRP) as potential cost effective alternative water supplies. A pilot study is underway of the so-called 160 acre Rapid Infiltration Basins (RIBs) site to see if SAT (soil aquifer treatment) is an effective method for the enhanced treatment of reclaimed water with the overall goal of meeting potable reuse water quality standards. A report of the findings and recommendations from this pilot study is due in June 2019.

### **Stormwater Treatment Reservoir**

In 2016, Toho partnered with Osceola County, Florida Department of Transportation, South Florida Water Management District, City of Kissimmee, and the City of St. Cloud to develop a regional stormwater reservoir in the heart of Kissimmee with a capacity of 400 million gallons. Up to 8 million gallons per day will be treated and used for reclaimed water to offset potable water use. As an additional environmental benefit, the reservoir will capture two urban drainage systems and prevent thousands of pounds of nitrogen and phosphorus from discharging into Lake Tohopekaliga (over 2,700 lbs of phosphorus and 25,000 lbs of nitrogen, according to the study conducted). Construction of the reservoir and piping systems will be completed in 2022.

### **Water Conservation**

Lastly, as comprehensive as all of these initiatives are, we understand that reducing wasteful water usage and the associated energy consumption are just as important in sustaining and managing water resources. Our award winning Water Conservation Program works with customers and developers directly to reduce their water demand whether it's potable or reclaimed water. Conservation programs have reduced outdoor water usage.

### **Questions & Answers**

*How did you go about implementing the practices/activities/programs that you described in your Overview paragraph?* Effective communication was essential to making sure that the expectations and

requirements of all of the participating stakeholders was understood. Due to the long-term nature of these projects, a commitment from the leadership team was required in order to ensure these projects remain part of the organization's strategic plan. Partnering with the private development community as well as with residential and commercial customers was critical in the ongoing planning and implementation of all of the projects we have underway. It is through these partnerships that we were able to combine our resources (human and capital) to achieve the results that are necessary to expand the acceptance and usage of reclaimed water.

*What type and amount of resources were needed to support implementation?* Reclaimed water projects are integral to our Capital Improvement Plan. As the community grows at a steady 4-5% per year, it drives the necessity to stay ahead and look for ways to decrease water demand. We have also invested heavily in the technologies that we rely on ensure the treatment processes are working as necessary to produce reclaimed water that meets all of the regulatory requirements.

Making measurable progress on these projects requires a significant time commitment from all stakeholders.

*Did you partner with other stakeholders or organizations as a part of your implementation process?* Yes, our partnerships play a critical role in all of the projects we've initiated. These partnerships allow us to come together and combine our resources to achieve outcomes that benefit all of the stakeholders and communities we serve. We have partnered with Osceola County, Florida Department of Transportation, South Florida Water Management District, the City of Kissimmee, and the City of St. Cloud on the regional stormwater treatment reservoir that was mentioned above.

*What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area and how did you do that?* Overcoming cost barriers have been a focus. By adopting the current pricing structure, it has made it economically advantageous to use reclaimed water for irrigation and other uses and inclining rates help curb over usage. Another challenge addressed was garnering continuing support from developers and builders. Often times, these initiatives may result in a higher cost to them and as a result, obtaining their cooperation for approaches like "One Water" can be difficult but achievable.

Has "smart" technology supported your implementation/optimization in this area? If yes, please describe. We rely on smart technology in two tracks to help us meet our objectives. Automatic Meter Reading (AMI) provides the ability to instantly know the water consumption trends in our service areas. Supervisory Control and Data Acquisition (SCADA) and other information management solutions allow monitoring and control of water reclamation processes to ensure we are producing reclaimed water that meets the quantity needed and the quality required.

*Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?* We have a link to the Water Cooperative of Central Florida's website on our website ([www.tohowater.com](http://www.tohowater.com)). For information on WaterReuse Association, their website is <https://waterreuse.org>. For information on the Potable Reuse Commission, their website is <http://www.waterreuseflorida.com/>. Also, a brief video was recently produced as part of a TWA Board proclamation designating May 19-25, 2019 as Water Reuse in Florida by the Florida Water Environment Association Reuse Committee and WaterReuse Florida. It can be viewed

here: [https://www.dropbox.com/s/10jmmuvnfd0ps4j/Water%20Reuse%20Week%20Video\\_FB.mp4?dl=0](https://www.dropbox.com/s/10jmmuvnfd0ps4j/Water%20Reuse%20Week%20Video_FB.mp4?dl=0)

If you would like more information on the projects we are working on, please contact our Public Information Office at 407-944-5174.

## Performance Measures and Results

Measure	Targets	Outcomes
What are you measuring?	What was your goal/intended	What were your actual
Supply major reclaimed water users to meet their irrigation needs. Major users are defined as using 0.1 MGD or more.	Minimize the quantity of potable water used for irrigation.	We are currently permitted to provide public access reuse to 37 major users throughout our service area.
Water quality is monitored year around via monitoring wells located throughout our service area.	To meet water quality criteria specified in Florida statutes - Chapter 62-520, F.A.C.	We utilize 62 monitoring wells to ensure the water quality of the land application sites.
% of effluent flow that is distributed as public access reuse.	Meet the irrigation demand of our customers so that potable water is not used for this purpose.	Over 40% of the discharged treated effluent was distributed as public access reuse. (Aug. 2018)
% of effluent flow that is discharged to the RIBs (2018)	Meet or exceed the minimum regulatory requirements for average daily flow without exceeding certified RIB capacity.	Over 50% of the discharged treated effluent was sent to RIBs. (Aug. 2018)
# of ongoing projects (and flow) that will allow customers that currently rely on potable water for irrigation to switch to reclaimed water for irrigation.	The intended outcome is to prolong the allowed groundwater withdrawal limit of 43.4 million gallons per day (MGD).	Five short term and intermediate projects. These projects are expected to reduce our demand by approximately 1.3 MGD.

# Trinity River Authority of Texas, TX

## Beneficial Biosolids Use



### Application Part 1: Background Information

Utility Name: Trinity River Authority of Texas		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Multiple Plant Regional System		
Service Area (square miles): 919,475	Average Annual Daily Flow or Demand (MGD): 191.30	
Population Served: 1,761,786		
<b>Location</b>		
Street Address: 5300 South Collins		
City: Arlington	State: TX	Country: U.S.A.
Zip Code/Country Code: 76018		
<b>Utility Representative Contact Information</b>		
Name: Patricia Cleveland	Phone: 817-493-5100	Email: clevelandp@trinityra.org
<b>Current Program Members Only</b> Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		
In what year did the utility achieve recognition as a Utility of the Future Today? 2016		
In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.  __ Activity Area 1: Beneficial Biosolids Use		

- Activity Area 2: Partnering & Engagement<sup>77</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>78</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>79</sup> ( IGP)

## Application Part 2: Organizational Culture

The Trinity River Authority (TRA) was created by the 54th Texas Legislature in 1955. TRA has three mandates: 1) provide water and wastewater treatment services 2) maintain a Master Plan for basin-wide development, and 3) serve as a conduit for tax-exempt financing for municipal projects and industrial pollution control facilities and as a local sponsor for federal water projects. TRA is both the largest river authority and wholesale provider of wastewater treatment services in Texas. TRA employs more than 450 people and operates four water treatment facilities, five regional wastewater treatment facilities, one reservoir, has water rights for four reservoirs and operates one recreation project. TRA's more than 60 customers include cities, utility districts, and the Dallas Fort Worth International Airport.

TRA adapts and changes by involving customers and recruiting and retaining a skilled, diverse workforce. On a daily average, more than 178 million gallons of clean water from TRA's wastewater treatment facilities makes its way to the Trinity River and its tributaries.

Each TRA wastewater plant is an award-winning operation. In 2018, the plants will be recognized by the National Association of Clean Water Agencies for complete and consistent National Pollutant Discharge Elimination System Permit Compliance. The platinum award and the years of acknowledgment will be presented to Central Regional Wastewater System (CRWS), 25 years; Red Oak Creek Regional Wastewater System (ROCRWS), 19 years; Ten Mile Creek Regional Wastewater System (TMCRRWS), 17 years, and Denton Creek Regional Wastewater System (DCRWS), 14 years in July 2019.

Collectively, the plants have impressive treatment statistics.

Regional Wastewater System	Rated		Service		Annual
	Flow MGD	Contracting Customers	Area Acres	Pop. Served	Avg Flow MGD
CRWS	162.0	21	503.125	1,451,701	157.597
DCRWS	11.5	11	127.344	84,666	8.061
MCRWS	3.0	4	122.481	38,375	2.618
ROCRWS	6.0	6	77.775	45,203	5.211
TMCRRWS	24.0	5	88.750	141,841	17.808

<sup>77</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>78</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>79</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

TRA spent over 60 years building a positive reputation locally, across Texas and the nation. That would not be possible if TRA did not support an organizational culture that inspires and embraces positive change and empowers the workforce to imagine, create, test, and implement innovative approaches from everyday work to extreme challenges.

Accordingly, the Authority has a five-year strategic plan for 2019-2024, which builds on the previous plan. The current plan, with its four priorities, will guide the Authority toward leveraging its strong foundation to empower the organization and the Trinity basin toward excellence in water conservation, reclamation, protection and development. TRA's core values are the fundamental principles that guide how TRA conducts itself in pursuit of its mission, vision, values and organizational excellence. TRA's leaders identified the following as the core values of the Authority:

### **Integrity in all Things**

Being forthright, honest and respectful in our interaction with each other, our customers and the public at all times, building and reinforcing confidence in our ability to consistently deliver high-quality service and results.

### **Service and Performance Excellence**

Applying progressive thinking, creativity, and adaptability to continually improve all areas of operations, resulting in a more agile and efficient organization.

### **Accountability to the Public, Customers and to Each Other**

Taking personal responsibility for our actions and decisions, as well as their consequences, in order to engender trust between and among Authority leaders, staff, customers, and the business and residents of the basin.

### **Teamwork**

Each employee is a contributing member of the TRA team, contributing different skills and experiences to the unity and efficiency of the group in order to achieve common goals.

### **Professionalism**

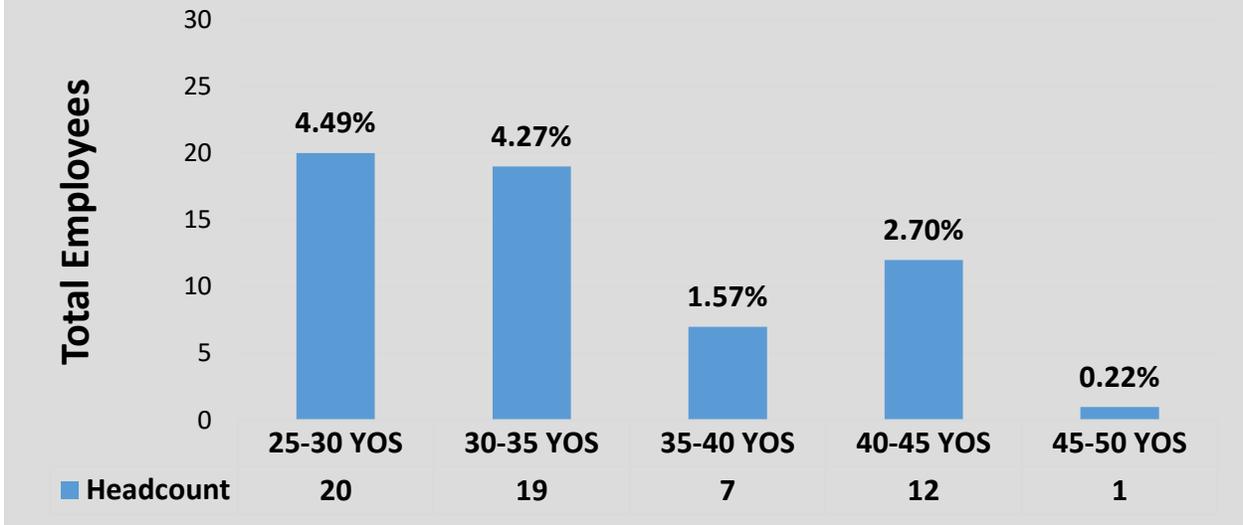
Behaving responsively and proactively in our delivery of service to our customers, characterized by the quality and diligence with which it is carried out.

**Pride in ownership, comradery, longevity, teamwork, and ingenuity** are a few of the terms that are used to describe the ways TRA employees are empowered to approach their work environment with verve and to take pride in their achievements.

TRA invests in the development of its employees. Currently, TRA has six in-house trainers approved by the Texas Commission on Environmental Quality (TCEQ) to provide water and wastewater training curriculum. These trainers provide classes that are needed by employees seeking to obtain their TCEQ water and wastewater operator licenses. This exhibits the strong teamwork that is experienced at TRA.

Many of the employees at TRA have worked here for their entire career. The graph below illustrates the long tenure of TRA employees.

## Trinity River Authority 25 and Plus Years of Service



While the long-term employee tenure at TRA is impressive, TRA also recognizes that succession planning and development programs are necessary to ensure a workforce of the future. Some of the opportunities offered by TRA include Operations Challenge, development academies, mentoring and volunteering. Below is a timeline of the TRA University Roadmap and the various programs that have been initiated.

TRA’s Water Environment Federation Operations Challenge teams, the CReWSers and the Waste Warriors, help staff realize their professional goals while building comradery and reinforcing teamwork. The TRA team members have been recognized nationally for their work with Operations Challenge. They also assist with other local Operations Challenge teams and out-of-state teams. The TRA team members state the importance of management and an organizational culture that supports their participation. Also, the knowledge gained during competitions help to increase licensing and operational effectiveness, while building and reinforcing teamwork and discipline. The CReWSers have won 22 state, 11 invitational, and 7 national championships.

TRA has a staff and career development academy and mentoring program. There is a Management/Supervisory Academy and a Leadership Academy. These academies allow individuals to develop and strengthen competencies for their career. The formal mentoring program provides opportunities to build the potential of employees and foster professional relationships.



# TRA UNIVERSITY ROADMAP

## 4-Year Snapshot 2015-2019



TRA supports employee growth and engagement through outreach programs that encourage volunteerism. Staff members receive regular opportunities to participate in the communities in which they live and TRA serves. Further, the outreach program brings employees together and enhances learning by allowing TRA staff to act as brand ambassadors.

TRA also supports a culture of managing and recovering valuable resources rather than one of the disposal of waste. This is demonstrated by TRA's commitment to its Beneficial Biosolids Reuse program. TRA has been beneficially applying biosolids with a contracted partner since 1999 except for a break in 2014-2015. In January 2018, TRA obtained Bronze level certification in the National Biosolids Partnership program and is currently seeking Silver level certification. TRA is investing over \$190 Million in converting its solids processing to thermal hydrolysis and digestion. This conversion will result in reducing the solids produced and will provide a class A product.

Involving the public is also important to TRA. In late 2018, TRA received a final report from the public relations agency hired to help measure public knowledge and reactions to land application of biosolids. The PR agency provided key findings and recommendations related to research conducted in key geographic areas. The information will be used to create messaging and materials.

Realizing that water is a finite commodity, over 35 years ago TRA, working with the Dallas County Utility Reclamation District, created the first large scale reuse project in Texas. The recycled water from CRWS is piped to the Las Colinas canals to improve outdoor amenities for irrigation. One benefit to consistently producing high quality effluent is that the final product is completely suitable for reuse.

In the 18,000-square-mile Trinity River basin, watershed stewardship is no longer a luxury. Because of the location of the DFW metropolitan area with nearly 7 million people in the upper portion of the basin, there is a very close connection between water quality, ecology, and water supplies. This triumvirate forms a closed loop as water moves towards the Gulf of Mexico, providing water supplies for half the population of Texas. TRA has taken a regional leadership role in these efforts and has a number of programs aimed at understanding and managing these relationships. These activities include implementation of the Clean Rivers Program; partnering with state agencies to implement studies to help assure protection of healthy river and bay systems; investigating the impact of invasive species on water

supplies and native aquatic species; implementing scientific investigations to understand the source, fate, transport and impact of various water quality constituents, including legacy pollutants, pharmaceuticals, and nutrients; and developing a Village Creek-Lake Arlington watershed protection plan to protect the water supply of over half-a-million people.

Additionally, TRA spearheads a forward-looking collaboration called the Upper Trinity Basin Water Quality Compact. This group of effluent dischargers to the Trinity River is committed to collaborating with the Texas Commission on Environmental Quality to implement reasonable science-supported wastewater discharge permits. This effort has created a system of basin-wide permitting. Moreover, its efforts help the Trinity River grow larger every year because of increased return flows. Overall, TRA works to stay ahead of regulatory and operational changes in the wastewater industry. Ongoing planning and system upgrades to meet treatment standards will continue with a focus on efficiency in operations and obtaining maximum use out of equipment and infrastructure before replacement is needed.

### **Application Part 3: Activity Area - BENEFICIAL BIOSOLIDS USE**

The Trinity River Authority (TRA) recognizes the value of utilizing biosolids beneficially to support agriculture through land application. During FY2018, TRA's Central Regional Wastewater System (CRWS) produced 85,022.51 dry tons (includes stabilization and dewatering chemicals) of biosolids. Due to potential concerns regarding odor issues, 8,019.63 dry tons were landfilled (9.74% of total dry tons produced). The remaining 91.26% were beneficially reused.

#### **Board/Executive Management Support/Business Case Evaluation**

The TRA Board of Directors has supported the beneficial use of biosolids since 1999 through a partnership contract with a hauling company since 1999, with a brief gap in 2014-2015. TRA is continuously evaluating and seeking to improve its program.

#### **Marketing Plan**

In January 2016, TRA retained a consultant to conduct a market analysis regarding its current biosolids hauling and disposal operations, and to determine if there were other options available in the marketplace. The goal was to identify what other biosolids management method(s) were available that might potentially provide more cost-effective and/or sustainable options for TRA. Land application, composting, heat drying and fertilizer manufacturing were identified.

Recognizing that there may be alternatives for beneficial use of biosolids, in July 2016, TRA issued a Request for Information (RFI) to obtain responses from interested parties regarding possible biosolids outlets. Five (5) responses were received. TRA spent the next few months evaluating the options. These ranged from constructing an on-site fertilizer manufacturing plant to compost generation.

After fully evaluating these options, TRA drafted a Request for Proposals (RFP) which was distributed in summer 2018. The RFP included a scoring methodology that provided incentive for diversification of biosolids use in the response. Two firms responded and the contract was awarded by TRA's Board of Directors in December 2018. The selected contract includes 3 options for biosolids disposal with 90% of the biosolids proposed for beneficial reuse; land application and curing to a Class A material for use as a soil amendment material. A component of this new contract includes a new process that further diversifies the CRWS biosolids program. This process involves curing filter press biosolids in windrows. Beneficial bacteria is reactivated in the windrows creating heat which meets time/temperature requirements for Class A biosolids.

This contract includes a provision for contractor marketing of the biosolids. TRA will receive 35% of the revenues from the sale of the biosolids.

## TRA Oversight/Risk Management Strategies

Currently, biosolids produced at CRWS are properly processed, monitored, and land applied to thousands of acres of farm and pasture land in nine North Texas counties for agronomical purposes. The biosolids act as an excellent soil amendment.

CRWS personnel perform periodic unannounced visits and inspections to the land application sites to ensure that the contractor is following best biosolids management practices concerning biosolids transportation and land application.

TRA has conducted multiple tests on various treatment chemicals to further enhance the biosolids through odor reduction. The CRWS personnel currently add ferric chloride for odor control on a regular basis as part of the processing in order to reduce odors. In addition, TRA conducted a chlorine dioxide study in December 2017 and again in 2018 to determine the effectiveness of using chlorine dioxide to reduce odors. The result was that a SOP was developed to use chlorine dioxide during situations where biosolids odors are higher.

## Monitoring and Measurement

TRA uses an in-house NELAP certified laboratory to analyze the biosolids. Samples of biosolids are taken from the process areas and analyzed for fecal coliform, pathogens, metals, nutrients, percent solids, and pH (for vector attraction reduction). TRA's sampling frequency is more aggressive than the federal, state, and local regulatory reporting requirements and are summarized in the table below.

Biosolids Sampling:								
FY 2018								
	Description	Yearly # of Samples	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	Total	% of Yearly Samples
Raw Sludge	Fecal Coliform	12	3	3	3	3	12	100%
	Helminth Ova and Enteric Viruses	12	3	3	3	3	12	100%
Belt Press Process	Fecal Coliform	36	9	9	9	9	36	100%
	Helminth Ova and Enteric Viruses	24	6	6	6	5	23	96%
	Metals (including TCLP)	12	3	3	3	3	12	100%
	Vector Attraction Reduction	48	11	12	12	11	46	96%
Filter Press Process	Fecal Coliform	36	9	9	9	9	36	100%
	Helminth Ova and Enteric Viruses	24	6	6	6	5	23	96%
	Metals (including TCLP)	12	3	3	3	3	12	100%
	Vector Attraction Reduction	48	9	11	12	12	44	92%
Results	Samples Exceeding TCEQ Limits	0	0	1	0	0	1	0%
	Results Still Pending	0	0	0	0	0	0	0%

**Participation in National Biosolids Partnership or Environmental Management System (EMS):** The biosolids EMS is a systematic approach that helps TRA continually improve activities that are associated with environmental performance.

The National Biosolids Partnership (NBP) sets standards and guidelines that TRA's EMS must achieve in order to receive and maintain NBP certification. A properly implemented EMS assists TRA's Biosolids Program with the following:

Identifying the overall goals and objectives of the Biosolids Program

Creating a series of management practices to meet the goals and objectives

Managing biosolids and monitoring and measuring the effectiveness of the program

Taking corrective and preventative measures if the management practices are not operating correctly

Conducting audits of the Biosolids EMS Program

Requiring management involvement to make changes to the program as needed

TRA currently holds a Bronze level certification. To obtain this certification, the TRA Biosolids Program created a Biosolids Policy Statement which was signed by management committing TRA to following the Code of Good Practice. TRA then drafted an EMS Manual and underwent a thorough evaluation and audit of the EMS practices and processes. The audit was conducted by TRA's internal audit team along with guidance from a consultant specializing in the National Biosolids Partnership Program. By completing this audit and addressing any findings with corrective actions, TRA became eligible for Silver Level recognition which was requested in April 2019. TRA's hauling contractor is an active partner in the biosolids EMS program and participates in the annual audits.

TRA has an EMS steering committee that helps to guide the progress on the achievement of the NBP goals.

### Goals and Objectives

TRA has established goals and objectives to help improve selected biosolids management activities. The goals are also in place to assist TRA with making progress toward the next level of the NBP. Goal updates are due to management every quarter and are an effective means for tracking progress. New goals and objectives are added when appropriate. For example, the NBP audit provided some recommendations that have now been added to the goal matrix below.

The in-house goal matrix for the National Biosolids Partnership includes:

Start Date	Strategy Task	Estimated Completion Date	% Complete as of 2/28/19
02/01/19	SOP Development and Implementation for Critical Control Points	Ongoing	10%
02/01/19	Review 1/3 of the SOP's and update accordingly	11/30/19	10%
02/01/19	Assign SOP ownership within EMS manual and include document control, revision history	06/01/19	20%
4/30/2018	Review EMS audit and implement steering committee recommendations	06/01/19	90%
10/1/2018	1 <sup>st</sup> Internal Audit, Submit Audit Results & Application to NBP	3/31/2019	100%
10/1/2018	2 <sup>nd</sup> EMS Onsite Ned Beecher Training: Audit & Internal Audit	2/14/2019	100%
06/1/2019	1 <sup>st</sup> Verification Audit 3 <sup>rd</sup> Party	09/1/19	20%
12/01/2017	Assign all CRWS staff annual GeoLearning Training via NBP	On-going	20%
02/01/2019	Create and maintain a list of stakeholders and interested parties	On-going	70%
02/01/2019	Maintain regulatory compliance through biosolids sampling and reporting	On-going	25%
02/01/18	Develop and provide training for the new online reference system (ORS)	11/30/19	20%

2/01/19	Develop checklist for Operations and Maintenance to ensure thorough Engineering plan(s) review (30%, 60% and 90%)	11/30/19	10%
3/1/2019	Formalize Web Site odor complaint form for use in documenting Biosolids complaints	4/1/2019	90%
3/1/2019	Develop a corrective action process	10/31/2019	50%
3/1/2019	Complete Annual Biosolids Report per NBP requirements	4/30/2019	80%
3/1/2019	Update Environmental Services Coordinator Job description to better encompass the NBP.	5/31/2019	20%
3/1/2019	Add the Internal Audit team to the Roles and Responsibilities Element in the EMS	8/31/2019	30%

### Public Involvement, Website and Publications

Involving the public is also important to TRA. In 2018, TRA received a final report from the public relations agency it hired to help measure public knowledge and reactions to land application of biosolids. The PR agency provided key findings and recommendations related to research conducted in key geographic areas. The information will be used to create messaging and materials. To inform this messaging, surveys were sent out in September 2018 to residents in ZIP codes where biosolids application sites are listed in TRA’s program. The purpose of the survey was to gain insight on how knowledgeable the public is about biosolids reuse/recycling programs. A Biosolids Message Map was created from the survey results. The Biosolids Message Map will be used to convey accurate information about biosolids reuse to neighbors, homeowners, media and stakeholders/partners.

TRA’s biosolids webpage on Trinitytra.org will soon include the EMS program to promote information sharing and opportunities for public input and feedback in a timely manner. The website will include links to various audit reports and annual performance reports. An odor report form link for the biosolids program and CRWS plant operations is available to allow the public a direct route to express any concerns or questions about biosolids or plant issues.

TRA has two biosolids brochures: Biosolids FAQs and Best Management Practices. These brochures are available to the public on TRA’s biosolids webpage.

Procedures established to reduce generation of biosolids in treatment systems/Facility improvements

Due to an aging infrastructure at the solids processing and dewatering building, TRA, through a construction contract, began construction on improvements and upgrades. Major components of these improvements and upgrades are the Thermal Hydrolysis Process and digestion. Commissioning of the new process should begin in March 2021. This new process will elevate the classification of TRA’s biosolids to Class A while reducing the final volume of biosolids. The improvement aligns with TRA’s Strategic Plan priority: Culture of Excellence, Goal: The Trinity River Authority stands for excellence in all things. This activity also aligns with the **Effective Utility Management Attributes of Product Quality, Customer Satisfaction and Community Sustainability**.

### Question & Answer

a. **How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?** The TRA Board of Directors has supported the beneficial use of biosolids since 1999. TRA has conducted this activity through a partnership contract with a hauling company.

TRA is continuously evaluating and seeking to improve its program. Reviewing diversification has been the focus of recent years. This is described in the Marketing section of the above narrative. The activities of quality control and public outreach are described above in the Monitoring and Measurement section above.

b. **What type and amount of resources were needed to support implementation?** (e.g., financial, staff, other) Specifically dedicated resources include an Environmental Services Coordinator position. This position oversees the daily operation of coordination and oversight with the hauling contractor, testing of the biosolids, and the National Biosolids Partnership program. A part time intern position was added to assist with the National Biosolids Partnership paperwork. Other supporting staff include plant management as well as TRA management. TRA has bid this work effort several times throughout the years to ensure competitive pricing is achieved, thereby minimizing financial impact as much as possible.

c. **Did you partner with other stakeholders or organizations as a part of your implementation process?**

Other stakeholders include the contractor who hauls and land applies the biosolids for beneficial reuse. TRA maintains a solid working relationship through daily contact with this contractor. Additionally, the farmers receiving the biosolids are stakeholders. Public relations is very important to the success of the program. As mentioned above in the Public Involvement, Website and Publications section, TRA has dedicated resources to further develop messaging for the public about the beneficial use of biosolids.

d. **What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?** The most critical obstacle is public perception. There are individuals who challenge the safety of beneficial use of biosolids in agricultural land application. Additionally, the truck traffic for hauling can be an obstacle. Coordination with local entities is important to overcoming these obstacles. Another obstacle that TRA has experienced lately is wet weather. Finding suitable options for storing material during extended wet weather events has been a challenge.

e. **Has “smart” information technology supported your implementation/optimization in this area?** If yes, please describe. In recent years, geographic information systems have been used to map the areas of land application and to ensure the buffers and distances are adhered to.

f. **Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?** The public messaging materials will be available on the TRA website soon. In the meantime, they can be obtained by directly contacting TRA (either contact on this form). Our staff are also available to discuss the program with anyone interested.

Utility of the Future Today Recognition Program provides an **optional** framework to report their resource recovery efforts for purposes of this application. This framework is based on the simplified survey form used in the determination of the WEF resource recovery baseline report (with support from the Utility of the Future partners WRF, NACWA, and WateReuse) on the 2017 baseline levels of resource recovery.

Please see below for the **optional framework** with the Trinity River Authority data along with an example of the spreadsheet showing some performance metrics that are tracked quarterly.

**GENERAL FACILITY INFORMATION - PLEASE COMPLETE ALL FIELDS**

<b>Facility Contact</b>	Name of Facility:	Trinity River Authority CRWS	Facility Contact:	Bill Tatum
	Street:	6500 W. Singleton Blvd.	Title:	Plant Manager
	City:	Dallas	Email:	tatum@trinityra.org
	Zip Code:	75212	Phone:	9722632251
	Country:	USA	Date of Survey Completion:	5/30/2019

The following information is collected for the purpose of categorizing surveyed facilities by treatment capacity, treatment process, and level of treatment. Data collected on current flows, population served, and influent loading will be used to compare resource recovery among different utilities.

Survey Segment	Analyte	User Input	Unit (Imperial)	User Input
<b>1. Influent</b>	• Annual Average Flow (2017)	137.99	mgd	
	• Other Accepted Waste Streams	No	• Specify type:	
<b>2. Rated Treatment Capacity</b>	• Hydraulic Treatment Capacity	162	mgd	
	• Organic Loading (as Biochemical Oxygen Demand)	266,351.38	pounds per day biological oxygen demand	
<b>3. Service Area</b>	• Total Population Served (2017)	1.5 Million	Number of current population served	
	• Number of Customer Accounts (2017)	21	• Population Equivalent per Account	Enter value if available
<b>4. Type of Treatment</b>	• Primary Clarification	Yes		
	• Secondary Treatment	Yes		
	– Activated Sludge	Yes	• Specify type:	Conventional Activated Sludge
	– Sequencing Batch Reactor	No		
	– Membranes	No		
	– Lagoons	No		
	– Trickling Filters	No		
	– Other	No		
	• Tertiary Treatment	Yes	• Specify type:	Media Filtration
	• Solids Treatment	Yes		
	– Chemical Solids Stabilization	Yes		
<b>5. Level of Treatment</b>	– Aerobic Digestion	No		
	– Anaerobic Digestion	No		Under Construction until 2020
	– Codigestion	No	• Specify Co-substrates:	Choose from drop-down list
	– Incineration	No		
	– Other	No		
	• BOD and Total Suspended Solids (TSS) Removal	Yes		
	• Nitrification	Yes		
	• Denitrification	Yes		No
<b>6. Influent</b>	• Influent Total Phosphorus (2017 Average)	5.75	mg/L as Total P	
	• Influent Ortho-Phosphorus (2017 Average)	2.4	mg/L as Ortho-P	
	• Influent Ammonia (2017 Average)	27.6	mg/L NH <sub>3</sub> -N	
	• Influent Total Kjeldahl Nitrogen (2017 Average)	39.3	mg/L as N	
<b>7. Effluent</b>	• Influent Total Nitrogen (2017 Average)	39.51	mg/L as N	
	• Total Effluent Flow (2017 Average)	137.99	mgd	
	• Effluent Total Phosphorus Concentration (2017 Average)	0.77	mg/L as P	
	• Effluent Ortho-Phosphorus Concentration (2017 Average)	0.5	mg/L as P	
	• Effluent Ammonia Concentration (2017 Average)	0.704	mg/L NH <sub>3</sub> -N	
	• Effluent Nitrate and Nitrite Concentration (2017 Average)	8.86/0.46	mg/L as N	
<b>8. Biosolids</b>	• Effluent Total Nitrogen (2017 Average)	10.92	mg/L as N	
	• Wet Mass Biosolids (2017 Average)	242,836.13	tons per year	
	• % Total Solids (2017 Average)	31.6	% total solids	
	• Total Phosphorus in Biosolids (2017 Average)	12,345.18	mgs/kg dry wt.	
	• Total Nitrogen in Biosolids (2017 Average)	34,739.00	mgs/kg dry wt.	

Survey Segment	Analyte	User Input	Unit (Imperial)
<b>6. Influent</b>	• Influent Total Phosphorus (2017 Average)	5.75	mg/L as Total P
	• Influent Ortho-Phosphorus (2017 Average)	2.4	mg/L as Ortho-P
	• Influent Ammonia (2017 Average)	27.6	mg/L NH <sub>3</sub> -N
	• Influent Total Kjeldahl Nitrogen (2017 Average)	39.3	mg/L as N
	• Influent Total Nitrogen (2017 Average)	39.51	mg/L as N
<b>7. Effluent</b>	• Total Effluent Flow (2017 Average)	137.99	mgd
	• Effluent Total Phosphorus Concentration (2017 Average)	0.77	mg/L as P
	• Effluent Ortho-Phosphorus Concentration (2017 Average)	0.5	mg/L as P
	• Effluent Ammonia Concentration (2017 Average)	0.704	mg/L NH <sub>3</sub> -N
	• Effluent Nitrate and Nitrite Concentration (2017 Average)	8.86/0.46	mg/L as N
	• Effluent Total Nitrogen (2017 Average)	10.92	mg/L as N
<b>8. Biosolids</b>	• Wet Mass Biosolids (2017 Average)	242,836.13	tons per year
	• % Total Solids (2017 Average)	31.6	% total solids
	• Total Phosphorus in Biosolids (2017 Average)	12,345.18	mgs/kg dry wt.
	• Total Nitrogen in Biosolids (2017 Average)	34,739.00	mgs/kg dry wt.

Survey Segment	Analyte	User Input	Unit (Imperial)	User Input	Unit (Imperial)	
9. Effluent Use	• Flow Discharged to Surface Water (2017 Average)	137.99	mgd			
	– Is the Effluent Discharged Directly into the Ocean?	No				
	– Is There a Downstream Intake for Drinking Water or Irrigation?	Yes		Lake Livingston for City of Houston	Drinking water intake	
	– Is the Effluent Discharge Critical for Aquatic Environmental	Yes				
	– Minimum Return Flow Obligation?	Select "yes" or "no"		• If Yes, Specify Quantity:	Enter value if available	mgd
	– Does Your Facility Have Rights to Reuse Your Effluent Water?	Yes		• What % of the Effluent Flow Can Legally be Reused?	10%	%
	– Flow in Receiving Stream Upstream of Discharge (2017 Average)	553.22				cubic feet per second
	• Flow Reused for Non-potable Use (2017 Average)	1.11				mgd
	– Crop or Landscape Irrigation?	No				
	– Industrial Reuse?	No				
	– Onsite Use of Non-Potable Plant Water (2017 Average)	10				mgd
	– Other?	No				
	• Flow Reused for Potable Use (2017 Average)	NA				mgd
	– Specify Type of Potable Reuse	Choose from drop-down list				
10. Biosolids Use	• Flow Used for Groundwater Replenishment (2017 Average)	NA			mgd	
	– Drinking Water Aquifer?	No				
	– Other Beneficial Aquifer Uses?	No				
	• Beneficial Use of Biosolids?	Yes				
	– Biosolids Applied to Land Application (2017 Average)	241,923.56				dewatered tons per year
	– Specify Land Type:	Agriculture				
	– Need to Maintain an Agronomic Rate for Nitrogen?	No		• If Yes, Is the Agronomic Rate for N Monitored and Maintained?	Choose from drop-down list	
	– Need to Maintain an Agronomic Rate for Phosphorus?	No		• If Yes, Is the Agronomic Rate for P Monitored and Maintained?	Choose from drop-down list	
	– Biosolids Used for Composting (2017 Average)	NA				dry tons per year
	– Solids Used for Incineration (2017 Average)	NA				dry tons per year
11. Phosphorus Use	– Solids Used for Other Beneficial Uses (2017 Average)	NA			dry tons per year	
	– Solids Disposed of in Landfills (2017 Average)	312.23			dry tons per year	
	• Phosphorus Recovered as Fertilizer	No		• Specify type:	Choose from drop-down list	
	– Mass of Fertilizer Production (2017 average)	NA				dry tons per year
12. Electricity Use	• Other Beneficial Uses for Phosphorus (Other than Biosolids Land Application and Nonpotable Water Reuse)	No				
	– Mass of Phosphorus Recovery from Other Uses (2017 Average)	NA			lbs per year	
12. Electricity Use	• Electricity Use on Plant Site (Total in 2017)	75,000,000			kWh per year	
	• Electricity Produced from Wastewater or Codigestion Substrates (Total in 2017)	NA			kWh per year	

Survey Segment	Analyte	User Input	Unit (Imperial)
13. Nitrogen Use Details	• Nitrogen Recovered as Commercial Fertilizer	No	
	– Mass of Nitrogen Recovered as Fertilizer (2017 Average)	NA	lbs N per year
	• Other Beneficial Uses for Nitrogen (Other than Biosolids and Nonpotable Water Reuse)	No	
	– Mass of Nitrogen Recovery from other Uses (2017 Average)	NA	lbs N per year
14. Other Energy Uses	• Natural Gas Use (Fossil Sources) (2017 Total)	703,368	kWh per year
	• On-site fossil Fuel Use (Diesel, Gasoline, etc.) (2017 Total)	80,564	gal per year
	• Biomethane Gas Produced (2017 Total)?	NA	kWh per year
	– End Use of Biomethane Gas Produced?	Choose from drop-down list	
	• Biofuel Produced (2017 Total)?	NA	gal per year
	• Use of Heat Recovered from Process?	No	
	– Estimated Recovered Heat Used Beneficially (Total 2017)	NA	Million BTU per year
	• Influent Mean Sea Level Elevation (First Major Unit Process)	380	ft
• Effluent Mean Sea Level Elevation (Outfall or Last Major Unit Process)	439	ft	
– Recovery of Kinetic Energy from Water (2017 Total)?	NA	kWh per year	

# Tucson Water, AZ

## Partnering and Engagement



**Tucson Water has built a culture that values water**

### Application Part 1: Background Information

Utility Description (combine all plants if a multi-site system)		
Utility Name: Tucson Water		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Large Municipal Water Provider		
Service Area (square miles): 400 square miles	Average Annual Daily Flow or Demand (MGD): 93.7	
Population Served: 730,000		
Location		
Street Address: 310 West Alameda Street		
City: Tucson	State: AZ	Country: USA
Zip Code/Country Code: 85701		
Utility Representative Contact Information		
Name: Silvia Amparano	Phone: 520-791-2666	Email: Silvia.amparano@tucsonaz.gov
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name: N/A	Title: N/A	Contact Information (phone or email): N/A
Current Program Members Only Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years		

In what year did the utility achieve recognition as a Utility of the Future Today?

In 2016, the utility achieved recognition Partnering & Engagement and Water Reuse. In 2017, the utility received recognition for the Energy Generation and Recovery along with Watershed Stewardship.

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>80</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>81</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>82</sup> (IGP)

## Application Part 2: Organizational Culture

Tucson Water adheres to clearly communicated core values that resonate with our employees – because those values originate from employees. Building and nurturing a positive organizational culture is on-going for Tucson Water. The Utility understands that a successful, thriving organization is not the result of any one person or leader, but the culmination of the efforts of every employee.

Tucson Water fosters a positive organizational culture with a comprehensive multi-prong approach:

► Front and center to our organizational culture: Tucson Water’s 2020 Strategic Plan, a published plan to internal and external customers that details Tucson Water’s commitments to our mission, values, goals, metrics, responsibilities and timeline for implementation.

Employees from all divisions of the Utility, from all positions, worked together in 2015 to synthesize the 2020 Strategic Plan. Four years later, the Plan remains a living, dynamic document – our core values remain constant, allowing goals, metrics, and responsibilities to evolve to meet new challenges.

Behavioral Values	Business Values
Integrity	Safe high-quality water
Respect	Reliable water supplies
Collaboration	Reliable water services
Commitment	Exceptional customer service
Responsibility	Sound planning
Leadership	Appropriate investment
	Sound financial management
	Protecting the environment
	Increasing efficiency and conservation
	Transparency and communication

The 2020 Strategic Plan:

<sup>80</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>81</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>82</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

Reflects the City of Tucson’s “Culture Map,” the foundation for strategic planning and positive transformation of organizational culture. This critical document outlines the commitment leadership makes to its employees at all levels, in all departments and in all locations throughout the organization.

**Assures consistency with voter-approved values** like Plan Tucson, the Water and Wastewater Infrastructure Supply and Planning Study (WISP), and other strategic plan objectives of the City of Tucson and Tucson Water.

**Promotes confidence** among employees, elected officials, City of Tucson Mayor & Council, the Citizens’ Water Advisory Committee (CWAC), and community leaders that Tucson Water is fully prepared to address responsibilities, opportunities, and challenges.

► **Offering continuous opportunities for professional development and training to all Tucson Water employees.** The Director’s Office provides information to all utility staff about upcoming internal and external training, conferences and summits, with daily and weekly reminders. Divisions manage their own budgets for travel and training expenses and are able to send employees to professional development conferences and to obtain certification training in their respective fields. This past year, employees from all levels of the Utility were able to attend conferences and training workshops, making employees enthusiastic about their future and gaining new skills that benefit Tucson Water and the community.

► **Providing multiple opportunities for dynamic communication.** Meetings with both internal and external stakeholders are routinely held to provide key project updates that are priorities in delivering safe and reliable water to our customers. The Utility’s leadership team meets weekly, with rotating “guest” employee speakers making presentations about hot topics and issues. The Director regularly writes an eblast to all employees, providing background on projects and issues – before the information appears to the general public. The Director’s Brown Bag luncheons held monthly allow employees to present intriguing topics. The April 2019 Director’s Brown Bag included these employee-to-employee “lightning” topics: Recharge without Recharge: Where is the Salty Water; Recharging Reclaimed Water in Tucson; Applying Thermal Infrared Imaging to Calculate Spatial and Temporal Evaporation Rates at the Landscape Evolution Observatory.

► **Formalizing and promoting process improvement.** In 2018, Tucson Water created the Office of Organizational Development (ODO). The ODO team is charged with developing the organizational infrastructure necessary to optimize the creation and use of business intelligence data, including key performance metrics and benchmarking. Their projects have already had positive impacts on the utility’s research, training, water quality reporting, and data collection.

Because the utility’s future success demands seamless, one-stop technology, Tucson Water launched a critical process improvement effort: the **Information Technology Business Operations Plan (ITBOP)**. Over 18 months, employees will be giving their input during workshops to achieve the Plan’s three goals: understand current technology’s gaps; improve capacity to deliver accurate, relevant and timely information to customers; increase access to information to allow the utility and City to make data-informed decisions.

► **Building expertise and relationships by creating cross-functional teams.** In the past 24 months, Tucson Water has brought together employees from different areas of the utility to work together on high-profile projects. For example, select employees from Maintenance, Finance, Public Information, Customer Service, and, GIS/mapping, worked together as a special “**Get the Lead Out**” team, with one goal: find and replace any remaining lead lines in the system. (Mission accomplished by the end of 2018.) Tucson Water has teams with a diverse mix of employees and managers working **on the Santa Cruz River Heritage Project, the Southeast Area Recharge Project (SHARP), the Santa Cruz Water Production Facility and a new Customer Service Feedback Survey.**

► Continuously refining an in-house skill-based pay program drives morale and creates a 21st Century workforce. Tucson Water’s Maintenance Division Water Administrator Jesus Suarez said it best: “Our Utility Tech (UT) Program has been a game changer – it’s transforming Tucson Water’s culture and workforce.” Every UT must complete a UT Program that includes mastering 27 separate skill blocks, such as fire hydrant, valve, main and pump repairs. The UT Program offers skill-based pay increases based on demonstrated learning. Each skill has a different monetary value ranging from \$0.27/hour to \$1.58/hour, based on the skill’s technical complexity. Entry into the UT Program is prized and it is one of the Utility’s most popular careers. Tucson Water continuously measures the program impact and plans in FY 2019/2020 to develop new training modules and fund additional trainers.

► **Celebrating and recognizing successes.** In 2018, Tucson Water refreshed and relaunched its Pride in Service campaign; employees who are recognized for exceeding internal and external customer expectations receive high-quality gear with the Pride in Service logo. Each year, the Utility also formally recognizes employees and teams with a celebration attended by staff and their spouses/partners. Hosting three employee events each year: Employee BBQ, Gala and a family event. The Water Director and Deputy Directors award a “**Director’s Coin,**” a coin medallion, to any Tucson Water employee who goes above and beyond to serve the organization, community or customers. We also budget **to create and submit award applications to recognize the innovation and expertise of our employees and our projects.** In the past three years, utility individuals and projects have won awards from the Southern Arizona Chapter of the American Public Works Association, Arizona Forward Environmental Excellence Awards, American Academy of Environmental Engineers and Scientists (AAEES), and the WaterReuse Association, among others.

### **Application Part 3: Activity Area – Partnering and Engagement**

#### **Overview Paragraph:**

► **Activity Area:** Partnerships in place with one or more community organizations with the partnership clearly branded and working toward specifically meeting articulated objectives.

**Response:** Tucson Water has partnerships in place with community, nonprofit and educational organizations, backed by memorandums of understanding, contracts and/or intergovernmental agreements (IGAs). Partnerships promote conservation, efficiency, and greenspaces. These organizations include:

**SERI (Sonora Environmental Research Institute):** Tucson Water and SERI offer grant/loan programs for eligible families with low income to help provide them with the opportunity for rainwater harvesting. SERI targets residents who traditionally have fewer resources and Spanish-speaking residents to install rainwater harvesting systems and purchase and maintain greenspace.

**Tucson Water works with the University of Arizona Pima County Cooperative Extension’s Smartscape Program,** a landscape water efficiency education program, offering classes and certification for both residential and landscape professionals. These classes educate homeowners in designing passive and active rainwater systems, a critical step for homeowners to apply for Tucson Water incentives and rebates. Classes are free to homeowners and spaces are ‘sold out’ each year.

**Utility partnership with nonprofit Watershed Management Group** offers education programs, tours, classes, and a resource library for professionals, students and homeowners.

**Tucson Water’s collaboration with the Southern Arizona Community Foodbank** targets and educates the Foodbank audience on using water efficiently and growing sustainable, local food plants and lush desert-appropriate landscapes.

**Southern Arizona Construction Career Days (SACCD),** a three-day dynamic event that introduces students to the skills necessary for a career at Tucson Water, plus other utilities, the trades, infrastructure,

engineering, design, architecture and more. In 2018, SACCD attracted 2,000 students, 200 vendors and 35 area schools.

In 2018-2019, Tucson Water participated in the Arizona Drought Contingency Planning steering committee to navigate an agreement amongst the State Central Arizona Water Conservation District (CAWCD, Cities, Agricultural Districts, Native American Communities and the Federal Government) to address long-term drought on the Colorado River. Specifically, Tucson Water created the "Tucson Backstop" to alleviate concerns of the Agricultural Community in case of a "Tier 2" shortage, which would have devastated some rural areas of Central Arizona.

► **Activity Area:** Utility seeks out assistance from or offers assistance to other utilities in formal or informal partnerships.

**Response:** "Collaboration" is a key behavioral value and is a driver of organization success. Tucson Water worked statewide with representatives of water utilities, irrigation districts, municipalities, and governmental agencies to draft and pass Arizona's contribution to the Colorado River Drought Contingency Plan. This process took years of work by thousands of individuals and entities to arrive at a plan that aims to keep the two key reservoirs on the Colorado River from falling to dangerously low water levels which could prevent the delivery of water and/or hydropower. It was negotiated among the seven states that draw water from the river.

► **Activity Area:** Neighborhood group/community project participation to create recreational opportunities and enhance community assets (e.g., parks, public spaces)

**Response:** Tucson Water garners neighborhood and community participation by working City of Tucson Mayor & Council offices, organizing project education and feedback sessions with homeowners associations and neighborhood groups, utilizing social media, partnering with local groups, and collecting feedback via customer surveys. Specific examples include: Tucson Water's Sweetwater Wetlands, an urban wildlife habitat, outdoor classroom and water treatment facility. There, the utility partners with the Tucson Audubon Society (nonprofit), Project WET (educational materials), and the University of Arizona (research programs). The Wetlands attracts 20,000 visitors a year, including birders from around the world. Tucson Water's Santa Cruz River Heritage Project, a reclaimed water/recharge project, is slated to launch June 24, 2019. The Utility engaged and educated environmental advocates and groups, neighborhood groups, recreational users, area businesses, influencers, and elected officials in visioning this project.

► **Activity Area:** Applying the Triple Bottom Line approach and stakeholder engagement processes used in support of decision making.

**Response:** Tucson Water utilizes a variety of stakeholder engagement processes to support decision making – decision making that reflects our values and emphasizes social, environmental and financial impacts (Triple Bottom Line). The utility offers town hall events and materials in both English and Spanish when seeking a water rate increase. Tucson Water schedule rate town halls at widely accessible public venues and offer sessions during non-work hours to ensure attendance. Tucson Water conducts focus groups, employee feedback sessions, online surveys and phone research to determine stakeholder opinions and perceptions about customer service, conservation and water efficiency, rates and communications. This feedback drives process improvements, focuses budgeting priorities, and shapes outreach materials. In areas affected by major infrastructure projects, we hold events, distribute information (in multiple languages) and door knock to ensure all are informed about project activities, timeline, and benefits.

► **Activity area:** Regular meetings hosted with community stakeholders

**Response:** The Citizens' Water Advisory Committee (CWAC), established in 1977, advises Mayor and Council regarding water system planning, water resource planning, and water rates and fees. The CWAC represents all Tucson Water customers without regard to city boundaries and is made up of community members and retired water professionals. CWAC members are appointed by Mayor and Council members and the City Manager. CWAC meets monthly and also has three active subcommittees; all meetings are supported by Tucson Water and subject to open meeting requirements.

**Tucson Water also participates in two “Think Tanks”:** The National Science Foundation, Water & Environmental Technology (WET) Center and the University of Arizona’s Water & Energy Sustainable Technology (WEST). Both memberships provide the utility access to regional utilities, nonprofit research organizations, local and national educational institutions, and industry leaders so we leverage resources in applying research to address water scarcity, water quality, and water reuse.

The Unified Community Advisory Board (UCAB) is a local EPA-sponsored board tasked with reviewing the work by all contractors involved in the cleanup of TCE and other groundwater contaminants at the Tucson Airport Remediation Project (TARP). The board is comprised of area residents and government agencies, including Tucson Water. Former aircraft and electronics manufacturing activities, fire drill training activities, and unlined landfills contaminated groundwater and soil in the TARP area prior to the 1980s. Groundwater cleanup, operation and maintenance activities, and monitoring are ongoing. The UCAB formed in 1995 and continues to meet several times each year.

► **Activity Area:** Highlight environmental education opportunities offered to community

**Response:** Tucson Water offers a wide range of education programs for students, teachers, homeowners and landscape professionals:

Tucson Water sponsors and underwrites K-12 programs: Arizona Project WET (Water Education for Teachers) offers no-cost water-related curriculum to educators via hands-on workshops. Nonprofit Environmental Education Exchange (EEE) offers a wide variety of certified conservation and environmental programs and materials.

**Improving rainwater harvesting and the urban tree canopy:** Tucson Water, in partnership with Tucson Clean & Beautiful, has funded the planting of 90,000 trees to increase the urban tree canopy and decrease heat island effects. In 2018, Tucson Water started a Neighborhood-Scale Stormwater Harvesting education and incentive program. The goal: direct and use stormwater flow with proper curb cuts and directed drainage to water landscape in traffic pullouts, traffic circles and the right of way.

► **Activity Area:** Web presence established with social media engagement

**Response:** Tucson Water’s website has the highest page visits of all of the sites hosted by the City of Tucson. Tucson Water created an integrated social media dashboard to assure that we utilize all our platforms – Facebook, Twitter, Instagram and YouTube -- on a regular basis. In the past year, Tucson Water created short videos and linked across platforms, in addition to several Facebook Live sessions to engage viewers in real time.

► **Activity Area:** The value of water, wastewater, and stormwater collection and treatment’s role in the social, economic, public, and environmental health of the community are actively promoted by the utility and its partners within the community

**Response:** Tucson Water inserts the **Water Matters Newsletter** in utility bills sent to more than 220,000 customer accounts each month, and also posts the newsletter online in English and Spanish. The newsletter is a communication conduit to the community, educating customers about the value of water, wastewater, stormwater, reclaimed water, and the role they play in the social, economic, public and environmental health of the community. In 2018 Tucson Water created and placed **public service**

**announcements in English and Spanish on local TV and on YouTube** about water quality, infrastructure, and water resources. Tucson Water collaborate with our partners – such as the University of Arizona Cooperative Extension Smartscape Program, SERI, and Watershed Management Group – to follow each other on social media and provide links on partner websites.

**Question & Answer:**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

Tucson Water has had Intergovernmental Agreements (IGAs) in place with the University of Arizona for decades. Tucson Water staff drafts IGAs and they are submitted to the University of Arizona's Cooperative Extension educators in the Smartscape **and AZ Project WET** programs for review and approval. Ultimately, the City of Tucson Mayor and Council review, vote, and adopt all IGAs.

For non-profits such as **Environmental Education Exchange (EEE), Sonora Environmental Research Institute (SERI), and Tucson Clean and Beautiful (TCB)**, we work together to pilot programs to collect substantive data to determine if a program warrants support and a formal contract. For example, SERI began reaching low income residents to participate in rainwater harvesting with grant money several years ago. Their proof-of-concept allowed for the program expansion that has reached nearly 200 residents as of 2019. Initial formal contracts held with nonprofits are short term with options to extend or renew. When proven successful, the programs are funded to continue or expand.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

There is a budget funded by a dedicated conservation fee assessed to customers for every hundred cubic feet of water used. This funding source sponsored Smartscape, Project WET, EEE, TCB, and SERI. Tucson Water staff provides the adult education programs with material for participants and help to promote their programs and classes available. By promoting the option to take classes at Watershed Management Group, that non-profit receives more community involvement, which is mutually beneficial to help WMG meet their goals.

Did you partner with other stakeholders or organizations as a part of your implementation process?

Yes, Tucson Water strategically partners with other city departments and utilities to ensure that the programming is appropriate for the region. In the case of EEE, our new contract will be shared with City of Tucson Environmental Services. For Arizona Project WET, the Town of Marana and other utilities have communicated their experiences in meeting their goals through youth education and professional development.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Changing the view of stormwater as a nuisance to a resource was our biggest obstacle. To be successful in changing this view, Tucson Water's ongoing efforts include:

Educating residents and neighborhoods about programs to support the community

Establishing and awarding 12 demonstration sites, including one at each Council Office

Increasing messaging to highlight four sources of water, the newest being rainwater/stormwater

Adding rainwater and conservation to youth programming

Communicating at professional conferences about Tucson Water projects and achievements

Updating CWAC and Council Offices regularly

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Yes. Tucson Water staff monitor green infrastructure using "Data Collector," a tool developed by GIS staff. Data about each site is collected into a tablet to inform decisions on where additional resources should be spent. All sites and residents that receive services as part of this partnership are identified in Tucson Water's databases that produce a variety of spatial information. There are data loggers at some sites to report water levels in tanks or soil moisture at green infrastructure sites.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

[https://www.tucsonaz.gov/files/water/docs/FY17-8\\_TW\\_Conservation\\_Report\\_FINAL.pdf](https://www.tucsonaz.gov/files/water/docs/FY17-8_TW_Conservation_Report_FINAL.pdf)

**Performance Measures & Results:**

<b>Activity Area</b>	<b>Outcomes</b>
<p><b>Partnerships in place with one or more community organizations with the partnership clearly branded and working toward specifically meeting articulated objectives.</b></p>	<p>Tucson Water has in place IGAs, contracts or working agreements with University of Arizona Smartscape, SERI, Watershed Management Group, Southern AZ Community Food Bank, AZ Project Wet, Tucson Clean &amp; Beautiful and EEE (Environmental Education Exchange).</p> <p>2017/2018 metrics:            AZ Project Wet reached 618 teachers, 36,365 students and 6,042 adults.            EEE reached 7,201 students.            Smartscape reached 963 adults with 105 workshops.            Water Harvesting Workshops reached 746 adults.</p> <p>Tucson Clean &amp; Beautiful: initiated pilot, committed to 90,000 trees planted.</p>
<p><b>Utility seeks out assistance from or offers assistance to other utilities in formal or informal partnerships</b></p>	<p>Tucson Water worked statewide with representatives of water utilities, irrigation districts, municipalities, and governmental agencies to draft and pass Arizona’s contribution to the Colorado River Drought Contingency Plan</p> <p>Tucson Water maintains Central Arizona Project (CAP) water “wheeling” agreements with communities in and around Tucson such as Vail, Marana, and Community Water Districts.</p> <p>Tucson Water also maintains an innovative CAP water sharing agreement with the City of Phoenix and Marana Water District.</p> <p>Participation in two Think Tanks with regional and national representatives.</p>
<p><b>Neighborhood group/community project participation to create recreational opportunities and enhance community assets (e.g., parks, public spaces)</b></p>	<p>Tucson Water’s Sweetwater Wetlands provides recreational space for the community, as well as birding and nature habitat. We have agreements with area nonprofits to provide student and adult education.</p>

	<p>Tucson Water has worked with neighborhood and community groups to shape the Santa Cruz River Heritage Project, slated to launch June 2019. The Project will bring excess reclaimed water to a dry river bed near downtown Tucson to create recreation opportunities along with a riparian habitat for natural vegetation and native species.</p> <p>Tucson Water is in the design stage of the Southeast Houghton Area Recharge Project (SHARP) which will result in a new reclaimed water facility with walking trails, bike paths and educational kiosks for the community.</p>
<p><b>Applying the Triple Bottom Line approach and stakeholder engagement processes used in support of decision making.</b></p>	<p>Tucson Water utilizes these tools to engage stakeholders helping to drive a Triple Bottom Line approach in decision making:</p> <ul style="list-style-type: none"> <li>Town halls and small group presentations</li> <li>Multilingual materials</li> <li>Facebook Live</li> <li>Focus Groups and Listening Sessions</li> <li>Employee Feedback Sessions</li> <li>Web-based Online Surveys</li> <li>Phone Surveys</li> <li>Intercept Surveys using tablets</li> <li>Comment Cards</li> </ul>
<p><b>Regular meetings hosted with community stakeholders</b></p>	<p>The Citizens' Water Advisory Committee (CWAC) is a committee comprised of 17 members, including water professionals and highly regarded community members. CWAC meets monthly and has three subcommittees: Technical Policy and Planning, Finance and Conservation &amp; Education.</p> <p>Tucson Water funds and participates in two Think Tanks with monthly meetings and bi-annual national meetings that involve research and technology presentations.</p>
<p><b>Highlight environmental education opportunities offered to community</b></p>	<p>Tucson Water sponsors and underwrites K-12 programs: AZ Project Wet, Environmental Education Exchange (EEE) and Tucson Clean &amp; Beautiful.</p> <p>Metrics:</p> <p>Arizona Project Wet, 2018 Outreach Numbers: 5,840 Adults, 11,795 Students, 555 Teachers.</p> <p>EEE, 2018 Outreach Numbers: 17,201 Students, 575 Teachers.</p> <p>Neighborhood-Scale Stormwater Projects 2017 Numbers: 20 Applications, 3 projects completed and 17 demonstrations sites.</p> <p>Tucson Clean &amp; Beautiful, initiated in 2017, purchased 90,000 trees to offset heat islands.</p>

<p><b>Web presence established with social media engagement</b></p>	<p>Facebook – 1,144 Followers  Twitter – 1,625 Followers  Instagram – 880 Followers</p> <p>Tucson Water website has the most visits of all the City of Tucson pages.  Tucson Water did their first Facebook Live sessions in 2018.  Tucson Water also created and launched short videos on social media and their website for the first time in 2018.</p>
<p><b>The value of water, wastewater, and stormwater collection and treatment’s role in the social, economic, public, and environmental health of the community are actively promoted by the utility and its partners within the community</b></p>	<p>Tucson Water launched the “One Water” program in 2018.</p> <p>Water Matters newsletter which goes to 220,000 customer accounts each month. (English and Spanish)</p> <p>Create and place Television Public Service Announcements in English and Spanish highlighting value of water.</p> <p>We collaborate with our partners to share and like each other’s social media to help spread the value of water.</p>

# Watercare Services Limited, Auckland, New Zealand

## Energy Efficiency



### Application Part 1: Background Information

Utility Name: Watercare Services Limited	
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Public water and wastewater utility operating a regional system comprising 23 water sources, 15 water treatment plants, 90 water reservoirs, 18 wastewater treatment plants, 16,800 kilometres of pipes and 584 pump stations; managing bulk and retail supply to the customer.	
Service Area (square miles): 1882	
Population Served: 1.7 million	
<b>Location</b>	
Street Address: 73 Remuera road, Remuera	
City: Auckland	State: Auckland
Zip Code/Country Code: 1050	
<b>Utility Representative Contact Information</b>	
Name: Shane Morgan	

## **Application Part 2: Organizational Culture**

### **A transformed business**

Watercare Services Limited is the water and wastewater utility provider for the Auckland region in New Zealand, servicing 1.7 million Aucklanders and over 20,000 businesses. Watercare are New Zealand's second largest infrastructure company, managing and operating over \$11 billion worth of assets. We treat and supply around water from 23 sources to Auckland every day. We collect, treat and dispose of wastewater daily, including trade waste from industry. We carry out significant work to upgrade and build infrastructure, to maintain levels of service and provide capacity for a fast-growing Auckland.

Watercare has gone through a significant amount of business transformation and change. The first catalyst for change has been the adoption of customer centricity, started when Watercare amalgamated with six local retail water companies to service over 400,000 domestic connections. The second catalyst for radical change has been a programme of wholesale digital transformation. Watercare have now completed a complete redesign of business processes, people and capability and our suite of business enabling technology applications.

### **Our journey toward fully sustainable**

The new direction has been articulated in our business mission, vision and values, built around four strategic priorities - Financial Responsibility, Business Excellence, Customer Focus and Fully Sustainable. Watercare will continue to fully meet all regulatory requirements whilst driving these four outcomes.

These four strategic principles have invigorated staff to deliver more than their traditional roles required of them and empowered radical innovation. Some examples of major changes to the way we deliver our business, all coming from staff initiatives, include:

The focus on sustainability has been clearly shown in the leadership position that the organisation has taken with regards to climate change, setting ambitious goals to be a low carbon organisation and one that is resilient to a changing climate. This leadership has come in many forms, from the CEO talking at public forums to staff 'squad' that has established the strategy and targets beyond.

Implementing a circular economy at our wastewater treatment plants started with rebranding to 'Resource Recovery Facilities'. Major initiatives include the Energy Neutrality Program described in Part 3, with our two largest Resource Recovery Facilities planned for full energy self-sufficiency 2025. This requires significant changes to our processes, the creation of a technology innovation unit and of an innovation centre.

Changing our planning methodology in 2018 to 'adaptive planning pathways', following work on deep climate change uncertainty. This has become the standard for all our planning work and we are educating the water sector on this approach.

Inventing new methods to control nuisance fly and midge, using no chemicals and having better midge control results. Our Environmental scientist is now liaising with other councils in the country to help them implement this approach

Shifting our water catchments from commercial forestry to permanent native forest for catchment stabilization, carbon capture and biodiversity outcomes. The Hunua ranges revegetation project targets 1900 hectares, which involves planting 8 million trees by 2035, one of the largest projects of this type that the country has ever seen.

Across the wider business, new ways of working have also been established as Watercare looks to the future. The Strategic Transformation Programme (STP) is the digital transformation of the business to enhance our systems, support better customer outcomes along with delivering dramatic efficiencies. This

programme has embraced the ‘Agile’ methodology to deliver this work, evolving design thinking in to a fully accountable, fast moving delivery pipeline to create new digital ways of working. The language of squads, stand ups and scrums, developer, minimum viable products and company wide release showcases is becoming common place.

### **Growing our people**

As an organisation we realise that our people are our greatest resource. If they are engaged in their roles, then the organisation will be successful.

Watercare has defined the expectation for its leaders. An exceptional leader at Watercare recognises that they are part of the collective leadership community; they coach, connect and empower their people to be better tomorrow than they are today. We have a vision that our leaders are here because they believe in our people, purpose and care about our customers; they take accountability for their own commitments, and the impact they have on others. The training that was delivered since 2017 to achieve these outcomes has touched around 150 people managers across the business and includes five days of tailored in house training. This is another opportunity to unite people within a cohort from across the organisation to further improve our culture and connectedness. This included a coaching programme, where our senior managers coached each coached three of our people leaders to help them in their leadership journey.

The indigenous Maori people of New Zealand and their way of living is of significant importance to Watercare. We are keen to understand our own heritage and learn about the culture of our native people. Staff have been involved in learning the Maori language and way of life in a strategic partnership with education provider Te Wānanga o Aotearoa. Beyond learning the language this involves understanding cultural responsibilities and engaging in the local community. A highlight of this community engagement has been spending weekends at local marae (a Maori meeting house).

### **Becoming a transparent organisation**

The quality and transparency of Watercare reporting on performance has been acknowledged globally. We implement the Global Reporting Initiative standards in our annual reporting and are one of only companies our non-financial and voluntary performance measures audited with the financial ones. The Australasian Reporting Association (ARA) has recognised this through awarding our annual report as the best sustainability report of the public and not-for-profit sector in Australasia in 2014, 2016 and 2018 and its 13th consecutive ‘Gold Award’ for standard of reporting. In 2018, we moved to the integrated reporting framework to follow worldwide best practice and report on financial as well as non-financial performance. This has led us to report on the highlights but also ‘lowlights’ of the past year, for a transparent and honest reporting to our shareholder, customers and communities.

### **Recognition**

These innovations across the business have been rewarded by twenty awards in 2018, including four energy-related awards (three at the Water New Zealand yearly conference and one nation-wide leadership award from the Energy Efficiency and Conservation Authority). Awards were also received in 2018 for Operations excellence, Health & safety innovation, Procurement change, Communications (for our management of the Tasman tempest and voluntary water savings campaign), Assistance to person needing support and several awards for best project of the year.

More performance information available on Watercare’s 2018 annual report:  
<https://watercareannualreport.co.nz/>

### **Application Part 3: Energy efficiency**

Overview Paragraph:

**Embedding change – delivering energy efficiency benefits that stand the test of time**

Four years ago, we launched a major Energy Efficiency programme at Watercare. Consuming ~115GWh per year, grid electricity is a significant operational cost for Watercare at USD6.5 million per year, with a further USD4.5 million in lines charges and natural gas usage. This had driven energy efficiency and energy generation initiatives in the past, which are still in place today, such as biogas capture at wastewater treatment plants and hydropower on water supply dams. However, the efficiency mandate had gradually been lost with the advent of automation and sensors and a sustained period of low electricity prices after the 2008 GFC. This led to a culture of treating energy as a commodity and a belief that energy efficiency would 'take care of itself'.

Watercare's Board made 'Fully Sustainable' one of the four strategic priorities for the organisation in 2015. This led us to challenge the way energy was managed. That challenge created a movement where we have seen the:

Creation of an Energy Manager role that is responsible for energy program delivery.

Cross business governance and 'squads' for an energy program implemented to an annual Energy Management Plan

Short-term energy savings targets being met of 8GWh by May 2019, with a further target of 8GWh again by 2022.

Awareness-raising via staff engagement through an annual 'Energy Week' showcasing energy initiatives and inviting people to 'do their bit' for energy efficiency

A USD200,000 Energy Improvement Revolving Fund for staff to implement marginal-benefit energy efficiency initiatives

Adoption of a new framework for recording energy efficiency improvements via the 'GRITS' web tool.

Our flagship energy project is Energy Neutrality 2025 for our two largest Resource Recovery Facilities, that treat 90% of Auckland's wastewater. To do this we are implementing a series of technological upgrades including: A-stage carbon harvesting, shortcut nitrogen removal, biogas production intensification via thermal hydrolysis and co-digestion, and climate change protection via specific peak flow treatments. If achieved today, energy neutrality would save 37GWh. As Auckland grows, the savings in 2025 will be even greater.

**Specifics of the Energy Neutrality include:**

Opened an Innovation Centre at the Mangere Resource Recovery Facility, refurbishing an old warehouse to host pilot projects and test the technologies required to revolutionize treatment processes and reduce their energy use to achieve energy neutrality. This is where we grew our first quantities of anammox bacteria, a new type of bacteria requiring 40% less energy to treat wastewater.

A peak flow treatment pilot project, testing innovative filtering technologies to treat peak flows in wastewater treatment plants during wet weather events. The peak flow treatment will provide robustness as a contingency measure for climate change.

Biogas and energy production maximization through Thermal Hydrolysis, with our first plant under construction at the Rosedale RRF and in design for the Mangere RRF. This process will increase our biogas production by 20%, equivalent to 5,400,000 kWh/year in both RRFs

Co-digestion exploration as an alternative source of organic waste (e.g. food and forestry waste) as digestion feed to increase our biogas generation output.

Our energy efficiency projects can be classified into four groups: control system improvements; the use of efficient equipment; treatment technology/ process improvements; and staff engagement/behaviour change. Specific energy efficiency projects already completed are as follows:

Initiative type	Project detail
Control systems improvements	<p><b>Orakei wastewater pump station:</b> The control system was modified to optimise the pump transition control strategy resulting in a 6.9% increase in efficiency with energy savings of 323,000 kWh/year (USD16,250/year).</p> <p><b>Mangere WWTP inter-stage pump:</b> Pump transition control was optimized resulting in a 3.5% increase in efficiency with energy savings of 346,000 kWh/year (USD\$17,550/year).</p>
Efficient equipment	<p><b>Mangere WWTP primary sedimentation tank sprayer:</b> Energy savings achieved by reducing the pump run time by 30% and replacing the oversized 85kW pump with a smaller 25kW pump changing the flow rate from 225 litres/second to 100 litres/second, resulting in energy savings of 3,500,000 kWh/year (USD\$177,450/year).</p> <p><b>Mangere WWTP UV upgrade (4 channels):</b> Four of 13 UV lamp channels were upgraded to more energy efficient lamps, resulting in estimated energy savings of 680,000kWh/year (USD34,500/year).</p>
Treatment technology & process improvements	<p><b>Mangere WWTP nitrite shunt:</b> Nitrite shunt implemented on four reactor clarifiers, resulting in confirmed energy savings of 940,000kWh/year and estimated energy savings of 2,900,000kWh/year (USDx/year).</p> <p><b>Mangere WWTP flow diversion:</b> Energy savings from diverting flow to the new energy efficient reactor clarifiers is 1,370,000kWh/year (USD69,500/year).</p>
Staff engagement/behaviour change	<p>Electrification of the pool fleet Nine electric vehicles make the bulk of the headquarters fleet</p> <p><b>Energy efficiency target and idea generation:</b> Establishment of company wide target to reduce energy and process for receiving ideas from across the business</p> <p><b>Make energy a priority:</b> Three annual energy weeks have engaged hundreds of staff members on the importance of energy in the home and at work.</p>

We are starting to see quantified results of the energy efficiency programme with the initial 8GWh savings target successfully achieved. However, since we are aiming for a sustained cultural change, significant effort has been made to modify the organisational structure to create the platform for the next level of energy efficiency work.

This is an important learning for the organisation and we can look to the future with confidence that our energy efficiency, cost savings and emissions reductions will continue to increase over the subsequent years of the programme, with exciting opportunities also now emerging in renewable energy generation and resource recovery.

### Question & Answer:

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

**Executive buy-in:** Watercare's energy improvement program is driven by the Chief Operations Officer, and is supported by the Chief Executive and Board;

**Clear strategic framework:** To provide a clear strategic direction and impetus for change, Watercare introduced its first Energy Policy in 2016 with the 8GWh savings, 2025 Energy Neutrality targets and Net Zero carbon 2050 pledge, which was endorsed by the Chief Executive Officer and published on our intranet;

**Get the data:** We use site performance data to help prioritize your energy improvement initiatives. The energy efficiency projects above were selected by Watercare based on the relative ease of implementation and/or the attractiveness of the potential benefits;

**Collaboration & partnering:** Seek support and guidance from agencies whose job it is to help and/or who may have similar interests.

**Build profile, staff engagement and awareness:** Behavioral change is underway to embed 'energy thinking' into all parts of the business from infrastructure design through to construction and operational management, and the annual Energy Week has proven to be a fun and effective way to showcase ideas and celebrate wins.

What type and amount of resources were needed to support implementation? (e.g. financial, staff, other)

**Executive leadership:** Advocacy for the energy program and policy by the Chief Executive Officer and ownership of the program by the Chief Operations Officer.

**Dedicated energy teams:** The Energy Team established in 2016 included the appointment of one FTE for an Energy Manager who is responsible for energy program delivery. This role was supported by an analyst role and a graduate-engineer (partly funded by EECA) and subsequently by a green energy specialist. The Technology innovation team in Operations excellence works with Planning to deliver Energy Neutrality. We also have two staff members in our Planning team dedicated to energy, are recruiting two electrical engineers in our Operations Excellence team to support the business and have a range of teams involved such as the Energy and Control System team in Digital and Asset Efficiency in operations.

**Access to opex and capex budget for initiatives:** The initial Energy Management Plan in 2016 outlined the business case for additional investment in energy efficiency initiatives and team resources, which was accepted by the Finance Team.

Did you partner with other stakeholders or organizations as a part of your implementation process?

**Business stakeholders:** A key attribute of the new energy teams is the support it provides to the major operational parts of the organization – Production (treatment) and Service Delivery (transmission and networks).

**Central government:** In 2016, Watercare entered a collaboration agreement with the central government Energy Efficiency & Conservation Authority (EECA) to co-fund energy efficiency and CO2 emission reduction activities. EECA has also been instrumental in helping Watercare to shape the first iteration of our Energy Policy and as a conduit for knowledge-sharing and the provision of best-practice advice. EECA also conducts an annual benchmarking assessment called 'One2five' that provides direction for future energy efficiency initiatives.

**Private sector partners:** Watercare has engaged its key engineering design partners to provide capacity and capability support for our cross-functional teams. In 2018, we started working with ABB Ltd to install smart meters and monitoring software on large pumps at several plants to identify future motor upgrades.

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

**Driving behavioral change:** Energy use can often be taken for granted and it has been difficult to convince some business stakeholders to reassess their operational behaviors using an energy lens, especially when ‘this is the way it has always been done’. Ultimately most people come to understand the operational cost benefits and/or the sustainability benefits that help enhance Watercare’s social license to operate.

**Funding for non-BAU initiatives:** The Energy Improvement Revolving Fund was a new concept for the Finance Team, who were initially hesitant but agreed to support the Fund. The Fund has strict rules regarding eligibility for funding and the financial benefits that are expected to be realized from each initiative.

**Bio-security risks:** Anammox rich sludge cannot be imported from overseas due to New Zealand’s strict biohazard restrictions; therefore an indigenous anammox microbe has been enriched from our own wastewater sludge. The new microbe is currently used to pilot side-stream deammonification treatment and will then be used for mainstream treatment.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Yes, as part of sourcing data (see Question 2a above) the use of electricity consumption information, SCADA systems and software modeling tools has been a key enabler for the energy efficiency program:

Sub-metering was installed on key process areas to provide real time monitoring for the top 10 energy intensive sites including Mangere WWTP and the Orakei pump station

Data analysis of pump operation at Orakei pump station and Mangere WWTP identified areas to optimize and informed the new pump transition control strategy.

Real time monitoring of dissolved oxygen, ammonia and aeration was instrumental to achieving nitrite shunt at Mangere WWTP

ISMM – Integrated (water) Source Management Model is a decision support tool that takes in to account energy efficiency as it optimizes storage and informs the off-take from each water source to meet demand

A Digital Twin for Mangere WWTP liquid stream treatment will be developed to help operators run the plant even more smoothly. The twin will be a virtual digital platform collecting live data from real process units and analyzing it through mathematical models and Artificial Intelligence

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Further information about Watercare can be located at: [www.watercare.co.nz](http://www.watercare.co.nz)

Watercare’s website includes a sustainability section. See the items ‘Climate change strategy’, ‘Reducing our carbon footprint’ and ‘Energy improvement programme’ for links to our commitments and achievements. <https://www.watercare.co.nz/About-us/Who-we-are/Sustainability>

May 2019 article from EECA on Watercare’s energy programme:  
<https://www.eecabusiness.govt.nz/resources-and-tools/case-studies/watercare-making-waves/>

As we start our solar generation programme, video and press release for the launch of our first three schemes in May 2019:

<https://www.watercare.co.nz/About-us/News-media/Pukekohe-Wastewater-Treatment-Plant-receives-solar>

Water New Zealand papers mentioned in part 2 are available on request

## Performance Measures & Results:

<b>Measure</b> <b>What are you measuring?</b>	<b>Targets</b> <b>What was your goal/intended outcome?</b> <b>(\$ are in USD)</b>	<b>Outcomes</b> <b>What were your actual outcomes?</b>
Energy consumption savings	8,000,000 kWh (2016-19)	8,160,000 kWh (achieved Dec 2018)
Operational cost savings	USD455,000 (\$700,000 in 2016 energy mgmt. plan)	USD409,500 (\$630,000) Note (LJ): Sum of USD savings in Question 1 is \$315,250 excl nitrite shunt figure
GHG emission reductions	1,030 TCO <sub>2</sub> -e (2016-2019)	1,050 TCO <sub>2</sub> -e (achieved Dec 2018)
Public funding raised to contribute to our energy improvement programme	Sign a collaboration agreement with EECA	USD240,500 funding made available to Watercare (2016-2019), new agreement in negotiation
Self-sufficiency of our Mangere and Rosedale RRFs	Energy neutrality 2025: 100%	2018 Mangere: 55% 2018 Rosedale: 75% (equivalent to 27% of Watercare's energy use)
Yearly One2five performance assessment	Year on year improvement	2 stars in 2016 and 3 stars in 2017 'One2five Express', limits of the tool reached First company in the country to use the full 'One2five enterprise' in 2018, starting at 2 stars

# Western Virginia Water Authority, VA

## Beneficial Biosolids Use



### Application Part 1. Background Information

Utility Name: Western Virginia Water Authority (Authority)		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional system with 980 miles of collection system. The Roanoke Regional Water Pollution Control (WPC) Plant is permitted to treat 55mgd of flow from five local jurisdictions in the Roanoke Valley. Five stand-alone treatment facilities are also operated in the Franklin and Botetourt County service areas. Two of these facilities are advanced on-site wastewater treatment facilities. The Authority also owns and operates five drinking water treatment facilities and multiple groundwater well systems that produce an average of 19mgd of drinking water.		
Service Area (square miles): 1570 square miles: Cities of Roanoke and Salem, the Counties of Roanoke, Botetourt and Franklin and the Town of Vinton	Average Annual Daily Flow or Demand (MGD): 37 mgd	
Population Served: 317,500		
<b>Location</b>		
Street Address: 1502 Brownlee Avenue, S.E.		
City: Roanoke	State: Virginia	Country: United States of America
Zip Code/Country Code: 24014		
<b>Utility Representative Contact Information</b>		
Name: Sarah Baumgardner	Phone: 540.283.2905	Email: sarah.baumgardner@westernvawater.org
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today?

2018

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>83</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>84</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>85</sup> ( IGP)

## **Application Part 2. Organizational Culture**

The Western Virginia Water Authority (Authority) owns and operates the Roanoke Regional Water Pollution Control (WPC) Plant, a 55 MGD facility with tertiary treatment. The facility discharge is governed by VPDES permit VA0025020. The cumulative elements of this permit create one of the most stringent discharge requirements in the Commonwealth of Virginia. In total the facility has over 7,000 compliance points annually with no exceptions granted in the permit structure. This high level of compliance protects our receiving river, the Roanoke River, and the popular 32 mi<sup>2</sup> Smith Mountain Lake that is located five miles downstream.

Starting in 2004 with the merger of the former Roanoke City and Roanoke County utilities to form the Western Virginia Water Authority, and later with the service expansion to provide water and wastewater service for our regional neighbors in Franklin (2009) and Botetourt (2015) counties, the Authority's organizational culture's has incorporated goals into our strategic plan and vision to enhance our environment, our community, our financial health and our workforce. Whether implementing the newest technologies in treatment and energy efficiencies, educating our next generation of customers or developing our current and future workforce, the Authority takes a proactive leadership role in our industry and our community. The Authority's commitment has been recognized with the NACWA Excellence in Management Recognition Award and the Utility of the Future Today award (Community Partnership and Engagement).

Started in January 2013, and substantially completed in FY16, the Peak Flow Enhancement Project allows the Water Pollution Control (WPC) Plant to fully treat and discharge more flow during high river stage events. The project involved construction of a new chlorine contact basin, new effluent screw pumps and modifications to the Biological Aerated Filter (BAF). The four new chlorine contact basins, which can hold over one million gallons, provide additional treatment capacity and offer system redundancy. Four Archimedes screw pumps are used when river stages are elevated and gravity feeding the flow into the river isn't effective. The Biological Aerated Filter (BAF) at the WPC Plant was modified to provide treatment from the equalization basins which enhances the overall peak treatment capacity of the facility and extends the storage capacity during wet weather events. These upgrades allow

<sup>83</sup> Previously titled "Community Partnership and Engagement" and updated in the 2018 Program.

<sup>84</sup> Previously titled "Nutrient and Materials Recovery" and updated in the 2018 Program.

<sup>85</sup> 2016 Activity Area "Integrated Growth Planning" was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

all flow leaving the plant to receive tertiary treatment. Modeling of the collection system as a whole, and manholes in particular, allow plant staff to proactively identify flow levels in the system and prevent potential wet weather overflows. Staff conducted a trial of aerial thermal imaging for I&I detection aimed at locating missing manhole covers in flood prone areas that are difficult or time consuming to access by foot or road. The company overflowed 30 miles of the Authority's sewer mains along creeks and located several manhole lids ajar that were then repaired by staff.

As the facility continues to focus on energy efficiency and sustainability, new blowers for the aerators at the Water Pollution Control Plant were installed in 2018. The new blowers are rated at 700 HP but deliver the same amount of air as 1000 HP blowers. In addition, they can be turned down to run at 350 HP during periods of lower demand. Methane gas, converted to electricity in the grant funded co-generation units, will be used to power the new blowers.

Enhancing the quality of life for our employees and our customer base is a key part of the culture at the Authority. This commitment is illustrated through the Authority's strong education outreach program, our staff's participation in the local United Way and Relay for Life campaigns and involvement on local non-profit boards, and our partnerships to provide recreational opportunities at our facilities. By working within the organization or in partnership with others, we are improving the quality of life in the community in which we all work and live.

The Authority has an established award winning outreach program (Water Environment Federation award) that offers free in-class and in-nature lessons to over 13,000 students each year. Two full-time and one part-time staff educators offer hands-on watershed experiences correlated to specific Virginia Standards of Learning for each grade to help students in our community learn more about protecting and preserving our environment and water resources. These hands-on experiences show tangible connections to the lessons students are learning in school and help them grow into adults passionate about our natural resources, desiring to work in the environmental field and striving to protect our water and watersheds. Tours are offered of the WPC Plant for customers, all new employees and students. In fact, tours of our facility have been included in the Micro-Biology curriculum for all five colleges in our service area as well as Virginia Western Community College students. The WPC Plant is also a noted birding location, and birding passes and birding tours are offered to members of the community as well as out-of-town visitors. The birding program was featured in a Treatment Plant Operator magazine article last year.

The Authority is also innovative in attracting a new workforce as seasoned employees reach retirement age. Facing an issue all too common in our industry – how to get skilled workers to fill roles left by retiring water and wastewater professionals, the Authority partnered with Roanoke County Schools to create a Registered Apprenticeship Program for high school students to train future water and wastewater treatment operators. Students complete their apprenticeship program in three years and earn a Class IV Operator license at the end of the apprenticeship, becoming licensed professionals in Water and Wastewater. This program, now in its third year, was selected as the Region Six winner of the 2018 Creating Excellence Business and Industry Partnerships Award.

Employees are also encouraged to participate in competitions such as the Operation Challenge team, equipment Road-E-Os and community parades. In 2017, the Authority's Operation Challenge team won the national competition and developed strong relationships with other wastewater professionals in Canada and the United States. All participants noted the bond that was created among the team and the education that came from working well as a team in a stressful situation. For four of the past five years, one of the Authority's sewer maintenance crew members has placed first in the Mid-Atlantic backhoe competition. Our Pre-Treatment Specialist, Lacy Burnette, was selected to compete on a two man team at the international IFAT World Water Skills event in Germany. Under the guidance of the WPC Plant's maintenance department and the Public Relations Department, parade floats are created for the community Christmas and St. Patrick's Day Parades. While the maintenance department's daily work of keeping the plant in peak operating form often goes unnoticed by the public, the parades give the

technicians a chance for the citizens to see their work. After the parades, these floats (themes include the Polar Express with a life-size train, Rudolph the Red Noised Reindeer, and “Pot” of Gold) travel to local elementary schools to the delight of students or are repurposed into the Authority’s booth at the local Relay for Life event. The Authority has been a consistent Best in Parade or Best Business Float winner for the past ten years.

The Authority has a strong partnership on academic research with Virginia Tech including studies on Biosolids land application and use, Biological Aeration Filtration and infrastructure predictive failure. An emerging research project with Virginia Tech through a National Science Foundation grant involves VT’s Dr. Cayelan Carey and a team of engineers, geologists, biologists, modelers, computer scientists, and social scientists to developed water quality forecasts similar to weather forecasts. Water quality sensors in the Authority’s reservoir wirelessly feed models running in the cloud that generate automated 16-day predictions of future reservoir conditions. Their forecasting system was tested this past fall and successfully forecasted the exact day of fall turnover onset and will be more rigorously tested this upcoming year to improve algal bloom management.

A strong fiscal policy supports all these goals by maintaining a financially viable operation that can protect and manage essential water resources through delivery of quality water and wastewater service while remaining flexibility in order to continually adapt to local and regional economic and regulatory changes. The Authority sets fees and user charges which provide for reliable operation of the utility, continued commitment to replacing infrastructure, system improvements and provides for growth while maintaining a healthy financial standing and adequate reserves for contingencies. User rates are projected as part of the annual budget process for each of the next five years and are reviewed annually. The Authority considers the affordability of rates in the context of local wealth and income indicators and maintains user rates within a range of 1.0 to 1.5% of median household income. The Authority has received the Government Finance Officers Association (GFOA) Award of Excellence for Reporting every year of our existence.

### **Application Part 3: Activity Area - Beneficial Biosolids Reuse**

The Western Virginia Water Authority (Authority) maintains 23 pond acres of lagoon space for digested biosolids storage at the Roanoke Regional Water Pollution Control Plant. The Authority contacts with Bionomics, Inc. for the management, removal, transportation, and beneficial land application reuse of the digested Class B biosolids on farmer’s fields in neighboring Franklin County, VA.

#### **Land Application of Biosolids**

After being fully processed in anaerobic digesters and then for nine months in lagoons at the WPC Plant, the nutrient rich biosolid material is applied to farm land as fertilizer. This is a free service supplied to area farmers by the Western Virginia Water Authority’s Water Pollution Control Plant. The quality of the biosolids, selected farmland and application process is held to strict standards set forth and enforced by the Virginia Department of Environmental Quality. The application rate is determined by a nutrient management plan prepared by a certified nutrient planner who determines the needs of the crops being grown on specific soils. Biosolids rates vary with the soil and the crop. Land application improves soil quality and harvest rates and prevents this beneficial product from going to the landfill.

#### **Program execution:**

The Western Virginia Water Authority partners closely with the Department of Environmental Quality and area farmers to work with producers who desire biosolids land application. The goal of this program is to help local producers improve their soil quality and non-food harvest rates while reducing the amount of material that ends up in local landfills. Because the Authority has 23 pond acres of lagoon space for anaerobically digested biosolids to process, many farmers benefit from this program. Staff is involved in the local producers’ networks and serve on the Board of the Blue Ridge Soil and Water Conservation

District, providing opportunities for positive communication between farmers and the Authority. The farmers who receive our product are equipped with the tools and talking points to share if they are approached by members of the community who object to biosolids. Farmers who receive biosolids have data to show that their once poor soil quality comprised of clay and mica now resembles a rich topsoil. This enriched soil holds moisture better, allowing for less watering and less run-off during seasonal downpours.

More information about the Authority’s biosolids land application can be found at <https://www.westernvawater.org/wastewater-service/wastewater-treatment/biosolids-land-application>.

**Performance Measures & Results:**

Measure	Targets	Outcomes
Dry tons of biosolids land applied	Land apply approximately 7,000 dry tons annually of biosolids	This past fiscal year, 8,623 dry tons of biosolids were land applied
Dollar value of fertilizer applied to farmers’ fields	The estimated value of the biosolids when land applied is over \$350 per acre. Farms that receive biosolids do not need to purchase commercial fertilizer	Saved farmers over \$12 million in fertilizer costs
Increase farmer knowledge about biosolids land application	Provide farmers information about how to sign-up for biosolids land application, talking points to share with neighbors and develop relationships	The Authority conducts an education day for farmers in the program where we discuss the program, share success and develop relationships with local farmers. The Fall 2019 program is in development

**Evaluation of Biosolids in Biodegradable Transplant Pots**

With future regulations about biosolids land application uncertain, the Western Virginia Water Authority began exploring alternative options for beneficial biosolids use. Scott Shirley, Director of Wastewater Services, worked with students and faculty from Virginia Tech to study the development of a biodegradable transplant pot made from digested biosolids from the Roanoke Regional Water Pollution Control Plant. The goal of this project, under the direction of Gregory Boardman, Chair Environmental Engineering at Virginia Tech, was to produce a high-value, sustainable Class A biosolid product while diversifying current biosolids land application practices.

**Product development:**

Virginia Tech Master of Science in Environmental Engineering candidate, Peyton Stone, worked under the direction of Gregory Boardman, Chair Environmental Engineering at Virginia Tech to develop plant pots made from beneficial biosolids. A goal of this research was to find a more environmental friendly plant container to replace the traditional plastic or peat pots. As stated in Stone’s research presentation, “the biosolids were tested for and met the metals and contaminants limits as required by the U.S. EPA Part 503 Biosolids Rule. In addition to the biosolids, other fibrous materials, such as used cardboard or cellulose, were used to stabilize and add structural strength. Multiple blends, or mixes, were developed, each varying in biosolids and fiber content on a dry weight basis, as well as different additives such as starch, polymer, or a natural glue. Tensile and puncture tests were conducted on the different mixes to determine the optimum strength that could be produced. The top performing mixes were used to create four-inch pots, for comparison to market leader, Peat Pots, and standard plastic pots. Greenhouse studies were conducted in two phases: • Phase 1 – analysis of leachate and assessment of pot stability through

watering cycles. • Phase 2 - growth studies for soybeans, marigolds, and romaine. These plants were selected based on growth ability and/or sensitivity.”

Stone noted “the plants selected for the study were Soybeans (*Glycine max* (L.) Merr cv. Hutcheson), Romaine lettuce (*Lactuca sativa* L. cv. Green Towers), and Sulfur Cosmos (*Cosmos sulphureus* av. Cv. Cosmic Orange). Soybeans were selected because the Virginia Team greenhouse bioassay team was very familiar with their growth and signs of stress in the plant. Romaine Lettuce was chosen because growth problems can be easily detected on the leaves. Sulfur Cosmos were chosen because the BioPots are more likely to be used for flowering plants.”

The largest challenge in this testing was finding the correct proportion of additives to stabilize the plant pot for shipping from manufacturer to store to home garden while still allowing for a release of nutrients when the pot was placed in the ground. While all tests indicated that plants grown in the biosolids pots had increased plant yield and health, additional research is needed to determine the scale up factors and marketability of the pots.

The use of biosolids in plant pots offers customers a sustainable choice for home gardeners, enhanced nutrients for plants and an income producing supplement to biosolids land application for wastewater treatment facilities.

Evaluation of Biosolids for Use in Biodegradable Transplant Containers by Peyton Stone:  
[https://vtechworks.lib.vt.edu/bitstream/handle/10919/75649/Stone\\_PF\\_T\\_2017.pdf?sequence=1&isAllowed=y](https://vtechworks.lib.vt.edu/bitstream/handle/10919/75649/Stone_PF_T_2017.pdf?sequence=1&isAllowed=y)

### Performance Measures & Results

Measure	Targets	Outcomes
Can an environmentally conscious product for local wastewater treatment facilities be developed that offers an alternative or supplement to biosolids land application	Work with students and faculty at Virginia Tech to create a plant pot made from biosolids and stabilizers that can replace traditional plastic or peat pots	Test pots were able to retain moisture longer than traditional pots and plant growth was improved; however, more research is needed before a full scale production to find the correct mix of stabilizers needed for the pots
Do plants grown in biosolids pots show increased plant health and yield	Plants grown in biosolids pots will show improved growth and yield.	Romaine lettuce, Cosmos flowers and soybean plants all showed improved growth and biomass production.

### Virginia Biosolids Council

The Authority’s Executive Director Wastewater Operations, Mike McEvoy, was a founding member of the Virginia Biosolids Council, an organization that includes municipal wastewater treatment facilities that clean the waters of Virginia communities, companies that recycle biosolids for gardening and home use, and companies that apply biosolids to agricultural fields and forests throughout Virginia. Mr. McEvoy remains active as a Board Member of the Virginia Biosolids Council.

**Program execution:** All members of The Virginia Biosolids Council subscribe to a voluntary Code of Good Practice to provide guidance for recycling biosolids in Virginia. The guidelines seek to capture current best practices by biosolids generators, land application companies and compost manufacturers and encourage them to go beyond the regulations to build good relations with the communities they serve. The Code encourages members to establish their own performance objectives that support the following

goals: Protecting the environment; Minimizing adverse social impacts; and Promoting education and awareness.

The Authority works closely with the Virginia Biosolids Council to develop marketing pieces, social media messages and to develop an educational day for our farmers. Citizens with questions can be referred to the peer-reviewed studies shared on the Virginia Biosolids Council website to receive factual information and answers to their questions.

More information about the Virginia Biosolids Council and the Authority’s biosolids land application can be found at <http://www.virginiabiosolids.com> or <https://www.westernvawater.org/wastewater-service/wastewater-treatment/biosolids-land-application>.

**Performance Measures & Results:**

<b>Measure</b>	<b>Targets</b>	<b>Outcomes</b>
Protecting the environment	Continual compliance with all applicable regulations for the safe production, transportation, staging and beneficial use of biosolids	The Virginia Biosolids Council acts as the conduit between regulatory bodies, farmers and wastewater facilities to make sure regulations are understood, met and communicated.
Minimizing adverse social impacts	Eliminate instances of adverse social impact associated with the production, transportation, staging and management and beneficial use of biosolids on agricultural and forest lands of Virginia	The Virginia Biosolids Council develops professional messaging, handouts and social media promotions that are shared by all member organizations. This provides consistent, fact-based messages.
Promoting education and awareness	Effective communication to the public, farmers and government officials regarding the value and benefits of biosolids recycling in the Commonwealth of Virginia.	The School of Plant and Environmental Sciences at Virginia Tech worked with The Virginia Biosolids Council on Fact Sheets About Biosolids. This information is available on the website in a brochure titled <i>Healthy crops. Knowledgeable neighbors. Everything you need to know about farming with biosolids.</i> This information is used at community meetings with neighbors or shared during personal visits with farmers.

# WSSC WATER, MD

## Beneficial Biosolids Use



### Application Part 1: Background Information

Utility Name: Washington Suburban Sanitary Commission (WSSC) Name Change: WSSC WATER		
Type (e.g., single plant, regional system, multiple plants, collection or distribution system only, stormwater, etc.): Regional System (Montgomery & Prince George's Counties of MD; consists of 2 water supply reservoirs, 2 water plants, 5800 miles of distribution system pipes, 5600 miles of collection system pipes, & 6 water resource recovery facilities)		
Service Area (square miles): <b>1,000 square miles</b>	Average Annual Daily Flow or Demand (MGD): 160 MGD	
Population Served: 1.8 million residents		
Location		
Street Address: 14501 Sweitzer Lane		
City: <b>Laurel</b>	State: <b>MD</b>	Country: <b>USA</b>
Zip Code/Country Code: <b>20707</b>		
Utility Representative Contact Information		
Name: Monica Johnson	Phone: 301-206-8199	Email: monica.johnson@wsscwater.com
If this application has been prepared by another entity on behalf of the utility, provide the information of the preparer below		
Name:	Title:	Contact Information (phone or email):

**Current Program Members Only**

Fill in this section only if the utility has been recognized as a Utility of the Future Today in prior years

In what year did the utility achieve recognition as a Utility of the Future Today? **2018**

In which Activity Area(s) has the utility been recognized previously? Include all Activity Areas for which the utility received recognition in prior years.

- Activity Area 1: Beneficial Biosolids Use
- Activity Area 2: Partnering & Engagement<sup>86</sup>
- Activity Area 3: Energy Efficiency
- Activity Area 4: Energy Generation & Recovery
- Activity Area 5: Nutrient Reduction & Materials Recovery<sup>87</sup>
- Activity Area 6: Water Reuse
- Activity Area 7: Watershed Stewardship<sup>88</sup> ( IGP)

## Application Part 2: Organizational Culture

Under the leadership and guidance of General Manager and CEO Carla A. Reid, WSSC is a Utility of the Future in creating an organizational culture where employees, stakeholders and community members feel valued, inspired and empowered. General Manager Reid’s three-pronged philosophy of Simplify, Focus and Connect - coupled with a strategic priority to Inspire Employee Engagement - serve as the cornerstones of a carefully developed suite of programs that meet the demands of an ever-changing organizational culture. The following narrative provides a snapshot of initiatives focused on employee, community and stakeholder engagement – all of which are led by employees and work seamlessly together to enhance our organizational culture.

### Employee Engagement

There are a variety of programs at WSSC that help inspire employee engagement and create a world-class organizational culture – all falling under the umbrella of #H2OPeople. Chaired by employees, the #H2OPeople committee is responsible for developing ideas to support and engage our 1,700-strong workforce.

One very popular internal #H2OPeople activity is Take a Co-Worker to Work Day, which launched in November 2017. Through this program, employees can request to shadow any colleague, manager, or individual in a different department to learn what that person does and how it relates to their own duties and responsibilities. Take a Co-Worker to Work Day is a well-received program that promotes teamwork and a greater understanding of the variety of jobs performed throughout WSSC.

To celebrate our #H2OPeople, we recognize commitment to the organization through our bi-annual Employee Service Awards. These awards recognize employees’ years of service - from five years all the way up to one employee with 45 years of service just this past January! These awards are live-streamed on our intranet so employees at all work locations can watch and cheer on their colleagues.

General Manager Reid is personally involved in enhancing organizational culture through her signature event, Us Teaching Us. Knowledge transfer is at the heart of this monthly, after-work activity where employees can sign up to teach a class on a particular topic or hobby they possess. Examples include

<sup>86</sup> Previously titled “Community Partnership and Engagement” and updated in the 2018 Program.

<sup>87</sup> Previously titled “Nutrient and Materials Recovery” and updated in the 2018 Program.

<sup>88</sup> 2016 Activity Area “Integrated Growth Planning” was removed from the 2017 Program and is encompassed in Activity Area 7. If the utility was recognized in this 2016 Activity Area, please check the box for AA7 and the box for IGP.

public speaking, abstract painting, vision boards, and healthy eating. General Manager Reid also hosts yearly Come In Unity Meetings – providing employees a chance to talk with the GM, ask questions and learn about upcoming programs and initiatives.

While on the topic of healthy eating, WSSC also makes a great effort to care for and nurture the health and well-being of our employees through our well-being program, MyLife. Through MyLife, employees have access to confidential coaching for health, life, work and relationships as well as a nutritionist, diabetes support, and many other program offerings. This includes extensive monthly programming for employees as well as a MyLife Advocate who travels to all WSSC work locations and meets with employees.

Leadership development is key to employee engagement. To that end, General Manager Reid has implemented a series called Leaders on the Same Page (LOSP), which occurs three times a year. This is an all-management meeting of nearly 250 managers that consists of three parts: How leaders are expected to be; What leaders are expected to know; and What leaders are expected to do. Each LOSP meeting focuses on one of our five strategic priorities and always includes a focus on employee safety, which is covered under the strategic priority: Protect Our People, Infrastructure, Systems, and Resources. The LOSP meetings also include an opportunity for managers to collaborate and problem-solve current issues facing the Commission and obtain crucial information to cascade throughout the entire organization.

Throughout our 100 years of service to our community, WSSC has been an innovator. That same problem-solving spirit is at the heart of our recently launched Innovation Hub – a new online tool for employees to submit new and innovative ideas. Submitted ideas are reviewed and selected based on specific evaluation criteria, level of impact and best chance for success. WSSC’s Innovation and Research Team also hosted a total of 13 brainstorming workshops at our facilities to discuss solutions to staff-identified problems that can help us be more efficient, reduce operating expenses and achieve our strategic priorities. The ideas were compiled, and participants ranked on the ideas. Working groups at each site have continued to work through the highest priority ideas and to develop a plan for research or implementation.

On May 14, 2019, WSSC held our First Annual Innovation Day, and it was well-received! Commission employees learned about our key research areas and innovative activities occurring across the Commission, which was presented by our in-house innovators through posters and demonstrations. Staff also had the opportunity to see vendor demonstrations of up and coming innovative technologies and pitch their innovative ideas to our Shark Tank judges. The winning team won a ½ day off and will see their idea being pursued at WSSC.

### **Stakeholder Engagement**

In celebration of our centennial, WSSC held a signature stakeholder engagement event on May 1, 2018 - our actual 100th birthday. WSSC’s Water Symposium provided an opportunity for water resource professionals to gain increased awareness about emerging technologies and trends in the water industry from experts in utilities, academia, government, and the private sector.

Connecting with our private-sector stakeholders and helping to enhance relationships within the business community is the focus behind our premier business outreach event: Tap Into Business @ WSSC. In 2018, we incorporated several smaller business outreach gatherings into one comprehensive event that offered breakout sessions to help companies submit winning proposals. A key part of this event is the networking session, which provides an opportunity for smaller firms to connect with large businesses in need of specific subcontracting needs.

### **Community Engagement**

#H2OPeople are also involved in broader community engagement activities. So far this fiscal year, we have participated in 70 community outreach events across Montgomery and Prince George's counties. These events include charity walks, community fairs, elected official constituent meetings and educational fairs. Included in the community outreach events, we have conducted 25 environmental education programs with local school children engaged in activities including fish releases, tree plantings, aquatic habitat shelter construction and watershed stewardship lessons.

Additionally, this fiscal year we have hosted 17 Science, Technology, Engineering and Math (STEM) programs to help get the next generation interested in careers in the water industry. During our annual eWeek activities, we hosted 17 college engineering students for Shadow an Engineer for Day. Thirteen WSSC engineers representing multiple disciplines and functions at WSSC participated taking the students to projects sites as well as facility tours to have students see the applications of engineering at WSSC. Notably, this summer we will host our first, week-long summer camp focused on girls in STEM through a partnership with Learning Undeafated.

Our community outreach staff held six train-the-teacher sessions in both Montgomery and Prince George's County schools, educating teachers on how to facilitate hands-on learning in environmental, water-related, and fats, oils, and grease (FOG) programs. In addition, we developed FOG curricula that is approved by Prince George's County Public Schools and taught to all sixth-grade students in the county.

Because WSSC understands that affordability is an important issue for our industry and customers, yearly we kickoff our #H2OPeople Giving Campaign. This year, WSSC employees raised \$86,733 to support the United Way and WSSC Water Fund programs. The total raised was 87 percent of our goal with nearly 40 percent employee participation. Of that amount, \$23,660 was raised for WSSC's very own Water Fund – established by employees and dedicated to helping those customers struggling to pay their water/sewer bills.

This year is the 25th Anniversary of the Water Fund. In recognition of this milestone, WSSC will host its second Blue Tie Ball, a fundraiser event and promote the Centennial history book, *Beyond the Pipes*; both have all proceeds going to the Water Fund. Additionally, WSSC is expanding its affordability options and hired an engagement specialist dedicated to increasing outreach and partnerships for affordability.

As you can see, WSSC has made creating an organizational culture where employees, stakeholders and community members feel valued, inspired and empowered a top priority. As we embark on our second century of service, we know we must constantly evaluate existing programs and research new initiatives to ensure we continue to be a Utility of the Future.

### **Application Part 3: Activity Area - Biosolids**

WSSC has a long history of biosolids beneficial use dating back to the 1980's & 90's when we produced and marketed composted biosolids as a garden amendment. We continue to land apply >70% of our biosolids as an agricultural fertilizer. The state-of-the-art Piscataway Bio-Energy Facility will be online in 2023 and is a renewed commitment to beneficial reuse. The centralized Bio-Energy Facility will process all of the biosolids from our five major WRRFs (60-70 dry tons/day annual average) through thermal hydrolysis and anaerobic digestion to generate a high-quality, Class A biosolids product. To effectively manage this new product and further promote reuse, we have initiated additional activities and programs:

**Thermal Hydrolysis and Anaerobic Digestion Pilot Study:** As a key element of the Bio-Energy facility design we conducted extensive pilot testing with Bucknell University to examine the effect of thermal hydrolysis, anaerobic digestion, and plant operations on volatile solids reduction (VSR) and other biosolids characteristics. The pilot study informed our changes in treatment strategies to help us achieve > 50% VSR and improved dewaterability, essentially cutting projected biosolids production and hauling costs in half. In addition to making a product of superior quality we anticipate significant reductions in hauling and disposal costs as a direct consequence.

Class B Certification for biosolids generated at Western Branch WRRF: Biosolids generated at Western Branch were previously incinerated in multiple hearth furnaces until 2012. Since that time biosolids have been disposed in landfills due the absence of process equipment required for bisolids stabilization at that plant. Within the past several years we have added a lime stabilization system, are meeting Class B stabilization requirements for land application, and are obtaining Class B certification for land application.

Biosolids Odor Evaluation and Assessment: Because odor control is paramount to any beneficial reuse program we recently partnered with the Olfactometry Lab at Penn State University to quantify biosolids odors from our Western Branch & Parkway WRRFs. To evaluate the effect of dewatering method, we compared biosolids odors from centrifuges and belt presses. In addition, we blended biosolids cake with composted wood chips over a range of blending ratios to measure the value of blending with other organic byproducts.

We are also partnering with Virginia Tech University to evaluate the influence of plant operations on biosolids odors. Solids from process streams throughout the Western Branch WRRF will be collected and processed in the lab to simulate full-scale conditions. Generation of biosolids odor compounds and other biosolids characteristics will be measured. Operational parameters to be evaluated include solids retention time; sludge storage time; mixing and chemical treatment. Results from these odor assessments will help us make informed operational decisions to minimize biosolids odor and promote a successful beneficial reuse program in the long-term.

Collaborative Participation with Research Team; DC Water and MWCOG: We recently began partnership with a research team from Penn State University and Material Matters Inc. (a WBE Firm) in response to a MWCOG solicitation for research. In this study we will investigate the effects of passive curing (post-dewatering) on biosolids odor & marketability. The material for the study will be Bloom©, a biosolids product produced by DC Water, which is similar to the biosolids that will be produced at our Bio-Energy facility. Logistical details of the study are currently being developed.

Use of Biosolids for Restoration: One of our in-house innovators pitched the idea of using our future Class A biosolids for water main break soil and reseeded, water main replacement soil and reseeded, construction restoration when ready for seeding, mulching, donations, marketing, and other miscellaneous uses. Typically, after we finish backfilling, regrading, fine grading, and prepping for seeding, the existing soil conditions are not optimal for grass growth. By adding the biosolids, we can more quickly establish groundcover. This application is being pursued now.

Conversion from Chemical to Biological Phosphorus Removal: To further optimize VSR at the Bio-Energy facility and reduce the amount of biosolids (and inert materials) that needs to be processed and land applied, we are investigating switching from chemical to biological phosphorus removal at several of our WRRFs. Preliminary design and planning for a pilot test of enhanced biological phosphorus removal (EBPR) at our Parkway WRRF is currently in progress. In this study we will be converting an abandoned secondary clarifier to a fermenter to promote the growth of robust phosphorus accumulating organisms. If successful we hope to implement at all our WRRFs, nearly eliminate alum addition, continue to meet low effluent phosphorus limits (0.18-0.3 mg/L as P), and substantially reduce the total volume of biosolids produced Commission-wide. A variation of this concept has already been implemented at the Seneca WRRF, and the plant has seen significant savings and benefits from the process.

These efforts reduce the amount of biosolids product, will improve the marketability of the biosolids, and will provide improved sustainability of the biosolids operations moving forward.

### **Question & Answer**

How did you go about implementing the practices/activities/programs that you described in your Overview Paragraph?

For big projects like our Bio-Energy project, we hired consultants to perform feasibility studies, develop conceptual designs, and implement through a design/build contract. We have created a line item in our annual budget specifically for research and innovation to fund studies like those presented above, and bring together our internal experts to move the initiatives forward. Our staff also participate as board members and committee chairs in professional organizations to build contacts and collaborative opportunities across the industry.

What type and amount of resources were needed to support implementation? (e.g., financial, staff, other)

WSSC has committed both financial (direct funding of research, evaluations, and design) and in-kind (time and labor) resources to make the activities presented possible. Staff from WSSC’s Financial, Engineering & Construction, and Production Teams have been heavily involved.

Did you partner with other stakeholders or organizations as a part of your implementation process?

WSSC has worked hard to expand our reach with other organizations. Specific to our efforts to promote beneficial reuse of biosolids, we have collaborated with:

- Penn State University
- Virginia Tech University
- Bucknell University
- Material Matters Inc. (a MBE / WBE firm)
- Metropolitan Washington Council of Governments (MW COG)
- DC Water / Blue Drop

What was the most critical obstacle that your utility had to overcome to be successful in this Activity Area, and how did you do that?

Common to most public utilities, an obstacle that WSSC must always consider is justification of cost when the benefits are not readily quantifiable and/or are long-range in nature.

Has “smart” information technology supported your implementation/optimization in this area? If yes, please describe.

Smart technology is not currently being employed to optimize biosolids beneficial reuse. Depending on the findings from the ongoing studies, we may be able to use online monitors or controls to improve the quality and odor of the biosolids.

Where could other utilities go to find additional information on this Activity Area or the activities/practices/programs that you implemented?

Several WEFTEC papers/presentations and Chesapeake Tri-Association Conference presentations have described our efforts and work. In addition, our website discusses our Bio-Energy project. <https://www.wsscwater.com/bioenergy>

**Performance Measures & Results:**

<b>Measure What are you measuring?</b>	<b>Targets What was your goal/intended outcome?</b>	<b>Outcomes What were your actual outcomes?</b>
Percent of biosolids beneficially used vs. total volume produced on an annual basis	Expand to 100% by 2020.	73% in 2018.

Reduction in biosolids production	40% solids reduction	>50% reduction in biosolids to be land applied (26% reduction by eliminating lime; 26% additional due to digestion)
Reduction in odor Detection Threshold (DT) of biosolids	Reduce Western Branch WRRF biosolids odor to levels comparable with Parkway WRRF biosolids (A successfully land-applied, Class B product absent of odor complaints)	Preliminary study showed Western Branch WRRF biosolids odor DT (2,512) was 190% higher than Parkway WRRF biosolids odor DT (864). Studies underway to reduce odors.
External partnerships	One beyond current solids hauling contractor	Six partners (Penn State, Virginia Tech, Bucknell, DC Water, Material Matters, MWCOG)

## **Appendix A: The Utility of the Future Today Joint Partnership**

### **About WEF**

The Water Environment Federation is a not-for-profit technical and educational organization of 34,000 individual members and 75 affiliated Member Associations representing water quality professionals around the world. Since 1928, WEF and its members have protected public health and the environment. As a global water sector leader, our mission is to connect water professionals, enrich the expertise of water professionals, increase the awareness of the impact and value of water, and provide a platform for water sector innovation. To learn more, visit [www.wef.org](http://www.wef.org).

### **About NACWA**

For nearly 50 years, the National Association of Clean Water Agencies (NACWA) has been the nation's recognized leader in legislative, regulatory and legal advocacy on the full spectrum of clean water issues. NACWA represents public wastewater and stormwater agencies of all sizes nationwide. Our unique and growing network strengthens the advocacy voice for all member utilities, and ensures they have the tools necessary to provide affordable and sustainable clean water for all. Our vision is to represent every utility as a NACWA member, helping to build a strong and sustainable clean water future. For more information, visit [www.nacwa.org](http://www.nacwa.org).

### **About WRF**

The Water Research Foundation is a 501c3 organization officially formed in January 2018 after the merger of the Water Environment & Reuse Foundation and Water Research Foundation. The merged Foundation is the leading water research organization, funding research, pilot projects, and technology demonstrations that maximize the value of all water, including wastewater, stormwater, drinking water, and recycled water. Learn more at [www.werf.org](http://www.werf.org) or [www.waterrf.org](http://www.waterrf.org).

### **About the WateReuse Association**

The WateReuse Association is the nation's only trade association solely dedicated to advancing laws, policy, funding, and public acceptance of recycled water. The WateReuse Association represents a coalition of utilities that recycle water, businesses that support the development of recycled water projects, and users of recycled water. Our members are incorporating water reuse into their water management strategies as a proven method for ensuring a safe, reliable, locally controlled water supply. To learn more, visit [www.watereuse.org](http://www.watereuse.org).

## **Appendix B: Utility of the Future Today Background**

The “Water Resources Utility of the Future” was first articulated in a 2013 publication jointly prepared by the National Association of Clean Water Agencies (NACWA), the Water Environment Federation (WEF), and the Water Environment Research Foundation (WERF). The Water Resources Utility of the Future: A Blueprint for Action sought to capture in one place current, emergent, and possible wastewater utility opportunities that, packaged together, presented a revolutionary future for the sector. That revolution would transform the traditional wastewater treatment system to a community-based resource recovery center and leader in the overall sustainability and resilience of the communities they serve. This Recognition Program has been specifically designed to further promote and enable the emergence of this new business model for the sector, provide recognition for those achieving these outcomes, and encourage peer-to-peer learning among utility members of the Recognition Program and with other utilities.

The sponsoring organizations for this recognition program understand that substantial excellence in the operations of wastewater treatment systems exists today. Many utilities optimize and continually improve their operations, consistently meet or exceed their regulatory requirements, plan and invest effectively for the maintenance, repair and replacement of their infrastructure, and engage their employees and communities in meaningful and productive ways.

While a variety of initiatives exist to promote and acknowledge excellent performance and sustainable management of utilities focused on our sector’s historic priorities – providing reliable, affordable, and responsible wastewater collection and treatment service, the most prominent of these is Effective Utility Management (EUM) ([www.WaterEUM.org](http://www.WaterEUM.org)). EUM is supported by eleven Collaborating Organizations, including all five partners of this Recognition Program. The Ten Attributes of Effectively Managed Utilities and Five Keys to Management Success form the basis for Effective Utility Management. When taken together, these Ten Attributes and Five Keys represent the basis for excellence in utility management. While EUM is not a requirement for recognition under this program, utilities are encouraged to use the EUM framework as they seek to become a Utility of the Future.

The 2016 inaugural Utility of the Future Today Recognition Program was created to promote actions that build on this foundation of excellent management and help small, medium, and large utilities transform their operations over time. During the initial year, 61 utilities were honored. In 2017, 25 utilities were honored (seven were recognized in 2016 adding a new activity area meeting the criteria), in 2018, 32 utilities were honored (25 new applicants and 7 re-applications), and in 2019, 43 utilities were recognized (13 new applications and 30 re-applications) The Utility of the Future Activity Areas focus on the key building blocks to this transformation: recovery and new uses of a full range of resources; and engagement as a leader in the full water cycle and broader social, economic, and environmental sustainability of the community. In addition, transformation of the internal utility culture in support of these innovations, and engagement in the community and formation of partnerships are necessary for success when operating outside of the traditional span of control of the utility.