

# 2016 Utility Honorees

## Utility of the Future Today



The partners of the Utility of the Future Today are pleased to present the inaugural program's 61 public and private utilities from across the U.S., Canada, and Denmark selected by a peer committee of utility leaders from an impressive number of first year entries.

The recipients were recognized and honored during a September 27 ceremony held in conjunction with WEFTEC 2016 in New Orleans—WEF's 89<sup>th</sup> annual technical exhibition and conference—as well as a number of commensurate events sponsored by the partners.

The recipients received a display flag and a special certificate to further identify and promote their outstanding achievement as a Utility of the Future Today.



The following 61 utilities have met the criteria for Utility of the Future Today by meeting the Organizational Culture requirement plus at least one of the Activities identified above. Recognized Activities are indicated for each utility as identified by a ★ and are listed in alphabetical order.

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**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. 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.



## 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. Organizational Culture is the foundation by which all other Utility of the Future Activity Areas are sustainably supported.

Utilities receiving recognition through this program are expected 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.



## Aarhus Vand, Denmark



### Aarhus Vand, Denmark

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Nutrients
- ★ Water Reuse
- ★ Watershed Stewardship

<b>Utility Description (combine all plants if a multi-site system)</b>		
Type (e.g., single plant, regional system, multiple plants, collection system only, storm water, etc.):		
Aarhus Vand Utility supplies drinking water to 280,000 people and produces 3962 million gallons/year. We have 19 well fields, approx. 100 abstraction wells, 9 waterworks, 10 elevation tanks plus a 932 miles transmission system. To measure it, we have installed 62,000 meters.		
Our responsibilities include the collection of waste water through a 1400 miles collection system that we operate and maintain. The waste water runs through 130 pumping stations into 4 medium-sized treatment plants. The transmission system has 10 waste water basins plus 225 separate rainwater basins. Approx. 7925 million gallons are treated annually.		
Service Area (square miles): 44.93	Average annual daily flow (MGD): 27.5	
Population Served: 280,000		
<b>Location</b>		
Street Address: Bautavej 1		
City: Aarhus, Denmark	Zip Code: 8210	
<b>Contact Information</b>		
Name: Projekt manager Flemming B Moeller	Phone: US +1 312-208-2980 DK +45 2920-8722	Email: US: <a href="mailto:flemol@um.dk">flemol@um.dk</a> DK: <a href="mailto:fbm@aarhusvand.dk">fbm@aarhusvand.dk</a>

**NARRATIVE:** Our Mission, Vision, Values and Strategy 2020 Form the Core of Our Culture.

### Mission

The company's objective is to offer and develop resource-efficient services throughout the water cycle, creating a climate-adapted healthy environment as well as growth and export to the benefit of customers and stakeholders.

### Vision

Aarhus Vand wants to be Denmark's leading water and wastewater utility. Aarhus Vand will focus on developing a value-adding water and wastewater utility with characteristics such as: Environmentally sound, resource-efficient, energy-neutral, well-run, innovative and partnership-promoting.

Aarhus Vand has an excellent basis for creating overall solutions and committing to sustainability in relation to the overall water cycle. Our water and wastewater divisions, each has their own considerable strengths and potentials and we can achieve a unique position by coordinating the competencies. At the same time, excellent opportunities have been created to streamline operations by utilizing synergies optimally in a wide range of areas. Continued development of our production plant combined with extensive participation in research projects and highly competent and well-educated employees will help ensure that we and our surroundings see Aarhus Vand as the leading water company in Denmark.

The key to the company's success is the employees at Aarhus Vand who all work individually as well as together to implement our goals and to keep our customers in focus in our daily work.

### Values

At Aarhus Vand, we not only manage by goals but also by values. Our four “WATER values” – a “united” feeling, responsibility, innovation and dialogue – are part of our DNA. The values are related to the following statements which must guide how we fulfil these values.

### Strategy 2020

In 2010, Aarhus Vand was established as a one hundred percent Aarhus municipality-owned corporation and the framework for an ambitious company was established with an 11 person Board of Directors – composed of external, private politicians, and employees. Also, external regulation of our and the utilities’ operating expenses added increased demands of efficiency, development, investments and partnerships.

From administration to a market oriented company, the focus in recent years has been to create a more efficient company with increased attention to the customer and with a sharp eye for the business potentials that our core business offers. Among other things, there is a wish to increasingly meet the needs of our customers, such as climate adaptation and environmental endeavours. But, customers are also looking for new services and products, which it seems natural for our company to be a part of delivering.

We create an even closer dialogue with our customers, wishing for them to know and understand our company to a higher degree. This increased focus on our customers also means that we will work more with segmentation of our customer base, as various groups of customers have different wishes and needs. Presently, we are communicating with our biggest industrial customers to find out more about their needs. With regard to our private customers, we have a virtual customer panel of 525 individuals plus an external “Advisory Board” – all of which inspires and guides us on our journey into the future.

Aarhus Vand has three focus areas – growth, productivity and ingenuity – and we want to strengthen our strategy towards 2020 and make it easier to see the connection between the nine sub-strategies that are the backbone of Aarhus Vand's Strategy 2020. This focus shows our wishes to create development within ourselves and the community by supporting the current trends to create growth, export, productivity and ingenuity.

At Aarhus Vand we work on reducing expenses, and resource consumption in production is matched by growth. It is healthy for a company to streamline and grow at the same time. However, increased production at lower costs and increased efficiency also translates into fewer employees. We do not want that. Our goal is to at least maintain the current size of Aarhus Vand. That's why we set ourselves the goal of creating growth to offset a reduction in the company, which increased productivity will call for. Our growth volume should match the reduction in our productivity volume.

Our third focus area is ingenuity which is an old word for innovation and more about creativity, getting ideas and creating the framework of being innovative. Ingenuity must form the basis of productivity and must point out our areas of growth.

We are working on ingenuity in an Ideas Forum on our intranet where we prepare action plans regarding ingenuity, hold workshops, and invite external parties to challenge us in areas of special importance. In addition to this, ingenuity is a key element in our customer and market strategy where we focus on developing new products and new product opportunities. In 2015, we employed a business developer whose task, among others, is to identify new products and services to make them marketable

and market them. As a whole, this will help us select, year after year, the right products to the benefit of Aarhus Vand and thereby our customers.

We have set specific objectives for 2016 in each area: We must increase gross revenue by DKK 30 million through new initiatives, we must increase productivity by 2 percent and we must market 5 new products or services. However, these focus areas point towards 2020 where the objectives are to increase productivity by 20 percent, to

increase growth by 20 per cent, and to measure the effect on our productivity and growth. By increasing productivity by 20 percent towards 2020, we are creating the latitude for growth and ingenuity which will help increase productivity. By also increasing growth by 20 percent towards 2020, we are, among other things, increasing revenue by DKK 120 million and creating the basis for up to 50 new jobs. Ingenuity is measured on the effect of productivity and growth.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

A bonus structure built around the three strategies – growth, productivity and ingenuity – has been implemented, giving all employees an opportunity to qualify for an annual bonus.

To involve all employees in the growth strategy, they are encouraged to participate at Idea Competitions to present new concepts for innovation leading to new products and optimization of operation.

Aarhus Vand is DS/OHSAS 18001 certified for health and safety in the working environment. Consequently, audits are done several times during the year by an external company that reviews procedures and practical security measurements.

Beyond the health and safety certification, Aarhus Vand is also certified within the environment, energy, and drinking water safety (HAZZAP) plus CSR; meaning a constant focus on improving the culture at work, expecting all employees to do their best and strive to do better every day.

By drawing on knowledge not only from Denmark, but also the US through our internationalization strategy, we gain knowledge from other utilities and create an opportunity for employees stationed abroad to broaden their competencies within water and waste water.

A MOU (Memorandum of Understanding) has been entered into with Metropolitan Wastewater Reclamation District of Greater Chicago (MWRD), whereby knowledge sharing on optimization of processes and operations is gained. Through exchange of employees, the concept is to continuously seek development of new and more efficient ways towards the Utility of the Future. Our latest major project that was put out for public tender was the expansion of Egå WWTP, where we used new innovative processes. This was accomplished in collaboration with consultants and developers together with whom we arrived at the right solutions and price structure.

#### *Performance Measures & Results*

- A growth of 15 mill DKK in 2015 - The result: 16 million DKK.
- Our 2015 goal was to grow by 2 %. The result: 2.9 %
- A wish in 2015 was to strengthen the company's growth through the creation of new products to offer our customers. 11 new products were identified in 2015 and will gradually be implemented.
- In 2013 our goal was to station an employee abroad to support us in the sharing of knowledge between utilities on other continents. And with the goal of supporting the Danish water industry.
- In 2014, through the Danish Foreign Ministry, we stationed an employee in Chicago. The result has been a substantial amount of professional contacts, partnerships and concrete orders to the Danish water industry.

#### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created

*100% of all sludge is being digested and utilized as Class B fertilizer on agricultural land.*

#### *Performance Measures & Results*

Class B sludge used on farm land - 100%

How much phosphorous is extracted annually? - 472,695 lbs/annually

How much nitrogen is extracted annually? - 927,990 lbs/annually

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)



- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Our treatment plants and utilities are all open for visits by schools and higher learning institutions, which thereby have the opportunity to include a visit in their curricula. This also gives us the possibility of influencing what the students are taught about the treatment of water and waste water.

On “Water Day”, there is open house for all residents in our community, giving citizens an opportunity to view the utilities and the associated exhibits on the need to be good stewards of the environment.

Together with Aarhus municipality, Aarhus Vand participates in climate adjustment projects, such as the establishment of recreational areas.

Together with Aarhus municipality, Aarhus Vand has established two large recreational areas – the two low water lakes Egå Engsø and Aarslev Engsø.

#### *Performance Measures & Results*

- Number of visitors at the plants - Approx. 4,000 visitors annually

#### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Goals and partial goals are in place for Aarhus Vand’s 2020 Strategy and CO2 neutrality.

KPIs are in place with regard to reduction of energy consumption and energy production.

Fleet control has been implemented whereby fuel consumption is reduced. This relates to our sludge trucks as well as driving personnel servicing and replacing our 62,000 water meters.

When implementing a CHP installation, we draw up contracts that secure efficiency guaranteed and energy produced.

At our treatment plants, monitoring programs with established sub-meters for larger consumers plus online calculations for all minor consumers have been implemented. Thereby the amount of consumed energy is reduced. We are actively working to implement main current de-ammonification to

considerably reduce the energy consumption in the processes. Two of our treatment plants have side stream de-ammonification installed.

All throughout process optimization projects that we have done during the course of a number of years, there has been a special focus on reduction of electricity consumption, chemical and resource usage. This was done in partnership with an external consulting company.

#### *Performance Measures & Results*

- Reduction of electric energy usage between 2010 – 2015 - 4,831,061 KWh / 20 % reduktion
- CO2-reduction 2010 – 2015 - 3,078 tons CO2 / 26 % reduktion
- Specifik Energy konsumption - 2010: 0,68 kwh/m3 2015:0,5 kwh/m3, Reduction 2010-2015: 27%
- Annual investments in energy initiatives During the period 2010 – 2015, an average of USD 1.4 million was invested annually in projects leading to increased energy production.
- Overall degree of energy self sufficiency - Went from 14% in 2010 to 42% in 2015

#### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Marselisborg treatment plant has achieved a total energy production of >200% degree of self-sufficiency. This was accomplished by utilizing a CHP system and thereby producing approx. 135% el. energy and 65% heat energy – both exported to the public net.

In 2015-16, new primary filters, digesters and a CHP system were installed at Egå treatment plant with the goal of being 150% self-sufficient with el. energy. To accomplish this, de-ammonification is implemented on the biology to further increase the degree of self-sufficiency.

Egå WWTP is also working on converting excess heat to produce el. energy which is done by converting thermal energy via a small turbine.

In 2016, an area outside the Egå WWTP was set aside for the planting of willow. The crop is fertilized with nitrogen via reject water from the treatment plant's final dewatering. This secures savings at the treatment plant in relation to aeration; but also results in considerable CO2 savings, as the crop binds important amounts of CO2.

#### *Performance Measures & Results*

- Total energy production at treatment plant (electric and heating) In 2010, Aarhus Vand as a total produced 10,020,000 Kwh/year. In 2015, we produced 14,000,000 kwh/year. An approx. increase of 40%
- Purchase of (energy for heating) During the period 2010 – 2015, Aarhus Vand has reduced their purchase of heat by 52%, based on optimal use of heat produces at the CHP systems.
- Marselisborg WWTP's degree of selfsufficiency. Aarhus Vand's largest WWTP produces 35% more energy for electric use than they buy. As for energy for heating, they produce 65% more than needed at the plant. This results in a total surplus of energy that can cover the energy consumption I the intire cachment arear, used for abstraction of drinking water, production, distribution, collection and treatment at the waste water plant. And bear in mind, this is done without adding any external carbon source

### **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities

Aaby treatment plant is producing a fertilizer product, PhosferCare, which is extracted via struvite. It is in the planning to introduce this process to two additional plants in 2016/17.

#### *Performance Measures & Results*

- Phosphorous extracted compared to what is available in the sludge - 3,2 %

### **WATER REUSE**

- Investments in reuse infrastructure
- 600,000 m<sup>3</sup>/annually is pumped from Egå treatment plant to Studstrup power plant where the water is used for cooling purposes.
- Both Aaby and Viby treatment plants use hydrogen peroxide for disinfection of the waste water. This to secure water quality in the recipient, which travels through the city's small river and a harbour environment close to the city.
- Our treatment plants reuse treated waste water for mixing of polymeric, cleaning of trash, and cleaning of sand. This results in a minimal use of clean water.

#### *Performance Measures & Results*

- Income through sale of water to Studstrup cogeneration plant. 130,000 DKK ( 19,000USD)

## WATERSHED STEWARDSHIP

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Concurrent control of the total waste water treatment system has been implemented in Aarhus – rain incidents are forecast via weather radar, where the discharge system and overflow basins are designed to transport and catch as much as possible of the combined rain/waste water to minimize CSO.

By implementing the above activities, it is now possible to swim in the inner harbour and the water quality meets EU's standards for bathing water quality.

Aarhus Creek has built a lock system at the mouth of the creek, hereby minimizing the risk of flooding Midtown due to increased water levels in Aarhus Bay.

### *Performance Measures & Results*

Reduction of CSO from 2009 to 2015 (CSO calculated in model)

- 2009: 1,440,000 m<sup>3</sup>
- 2015: 417,000 m<sup>3</sup>

## Albuquerque Bernalillo County Water Utility Authority NM



### Albuquerque Bernalillo County Water Utility Authority NM

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Water Reuse

Utility Description (combine all plants if a multi-site system)		
Type: Multiple water and wastewater plants, distribution and collection system		
Service Area (square miles): 303	Average annual daily flow (MGD):	
Population Served: 660,000		
Location		
Street Address: One Civic Plaza NW		
City: Albuquerque	State: New Mexico	Zip Code: 87102
Contact Information		
Name: Frank Roth	Phone: 505-289-3102	Email: froth@abcwua.org

**NARRATIVE:** 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 proven itself an innovator in managing scarce water resources in its service area.

#### Effective Utility Management

In 2011, the Water Authority began to integrate 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 indicators from the 2008 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 utility priorities are set and why financial resources are allocated the way they are.

The Water Authority also is using the EUM Benchmarking Tool as part of its continuous performance improvement process. The Tool creates a customized self-assessment containing only the relevant attributes, practice areas, and performance measures identified by the utility. In 2014, the utility completed its first round of the self-assessment utilizing 99 of the Tool's 118 performance measures. In 2015 and 2016, a leadership committee used the results of this self-assessment to evaluate the utility's EUM Attribute performance gaps on the 99 chosen performance measures. Based on the outcome of this evaluation, the committee developed a guiding document with recommendations for performance improvement.

A major benefit of the Tool is that it has helped the Water Authority facilitate internal discussion regarding performance, strategy evaluation, and establishment of future business objectives.

#### Innovation Communication Management

Communication plays a significant role in promoting innovation management in as much as it promotes buy-in and acceptance from employees and customers as the utility adopts new practices, policies, and programs. Therefore Water Authority has adapted its business model to place a high priority on educating employees and customers regarding the utility's strategic objectives. Two "low-tech" engagement efforts that have shown particular promise in this area are Employee Expectations and Customer Conversations.

*Employee Expectations* – This program ensures that all employees' performance goals are aligned with the policy strategic objectives adopted annually by the governing board. 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 success to the success of the utility, Employee Expectations promotes

accountability and opens up opportunities for dialogue about work expectations among supervisors and employees.

*Customers* – 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.

The Customer Conversations program features interactive sessions intended to educate and inform while also soliciting ideas and opinions. Staff provided 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.

#### Resource Management: Aquifer Restoration via Reuse

After decades decline due to unsustainable overpumping, the aquifer beneath Albuquerque is on the rebound as a direct result of a multifaceted, community-supported effort that made groundwater renewal, and long-term water supply sustainability, its primary goals. Aquifer levels have risen by as much as 15 feet since 2008 – during several years of drought. And the rise is projected to continue for another decade.

Reuse was one of the major components in the aquifer’s rebound. Reuse projects have been in place for more than a decade and now account for five to ten percent of consumption in the utility’s service area. In the Northeast Heights, industrial effluent is combined with non-potable surface water and used on parks and golf courses. In Southeast Albuquerque, reclaimed wastewater is being delivered to irrigation customers accomplished by “polishing” wastewater and using it to irrigate large turf areas such as parks and golf courses. A planned facility will eventually serve the city’s northwest quadrant as well.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model

- Integrated EUM framework into utility's strategic planning process. Produce quarterly EUM Performance reports by Attribute area. Conducted self-assessment on all Ten Attributes with the Water Research Foundation by EUM Benchmarking Tool
- Established EUM Performance Improvement Leadership Team to evaluate EUM Tool performance gaps and develop strategies to address performance gaps and achieve desired targets.
- Established Water Talks and Lunch & Learn teaching/learning programs that provide a forum for informal discussion, networking, learning and problem solving
- Employee Appreciation program awards \$20,000 annually to employees that go beyond their expectations and meet the highest standards of service.
- Implemented Injury Reduction program in 2006; injury hours have been reduced by 80% in last ten years.
- Implemented Employee Expectations program in 2014 to align employee performance to the utility's core values, mission and vision. The program has helped improved performance by communicating the importance of the utility's long-terms goals and strategies of its continuous improvement program. The program provides a dashboard of employee performance in the six core value areas.
- Implemented a Knowledge Management Strategy in 2009 to transfer knowledge from critical employees before they retire.
- Developed a sound financial plan that maintains strong reserves, maintains target coverage ratio, and ensures funding to meet infrastructure renewal and other revenue requirements
- Developed a performance-based budget and aligns the budget to performance measures and objectives which ensures adequate balance of revenues to expenditures and cash reserves.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Employee Pride in Workplace	88% (63% strongly agree; 25% somewhat agree)
Employee Satisfaction with Leadership	75% (47% strongly agree; 28% somewhat agree)
Employee Ability to Perform Job and Be Recognized	80% (52% strongly agree; 28% somewhat agree)
Employee Opinion on Positive Work Environment	81% (45% strongly agree; 36% somewhat agree)
Customers satisfied with the services they receive from the Water Authority overall	93% (56% very satisfied; 37% somewhat satisfied)
Customers satisfied with the reliability and availability of water	97% (78% very satisfied; 19% somewhat satisfied)
Customers satisfied with the reliability of the sanitary sewer system	92% (70% very satisfied; 22% somewhat satisfied)
Customers satisfied with the quality of the drinking water	79% (46% very satisfied; 33% somewhat satisfied)
Customers satisfied with effectiveness of the Water Authority to control odors from sewer lines or treatment facilities	72% (46% very satisfied; 26% somewhat satisfied)

<b>Metric</b>	<b>Description</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>Target Status</b>	<b>Trend</b>
Training Hours per Employee	Measures the quantity of formal training hours completed by total full time employees	19	17	24	Good	Good



Employee Turnover Rate	Measures the rate of employee departures by the average number of regular employees	2%	2%	2%	Excellent	Excellent
Retirement Eligibility	Measures the number of employees eligible for retirement within the next five years	15%	13%	11%	Good	Good
Internal Employee Promotions	Measures the rate of internal employee promotions by the total number of positions filled	37%	48%	39%	Good	Excellent
Customer Accounts per Employee	Measures the number of accounts by the number of full time employees	346	345	346	Excellent	Excellent
Water O&M Costs Ratios	O&M costs: distribution per MG	\$533	\$481	\$648	Excellent	Excellent
	O&M costs: treatment per MG	\$556	\$302	\$308		
Sewer O&M Costs Ratios	O&M costs: collection per MG	\$344	\$499	\$330	Good	Good
	O&M costs: treatment per MG	\$595	\$521	\$578		
Non-Operational Meters	Measures non-functioning meters that are being estimated	2%	1%	.05%	Excellent	Excellent
Energy Consumption Efficiency (kWh/MG)	Water operations consumption	3,450	3,953	4,003	Excellent	Excellent
	Sewer operations consumption	2,261	1,771	1,739		
Cash Reserves	Days Cash on Hand (Days)	15	78	60	Good	Good

### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use
  - Provide tours of Soils Amendment Facility to local gardening and compost groups
  - Partnered with local waste haulers to receive food waste, which is used in the recipe to convert biosolids to Class A compost
  - Bio-solids management by composting diverts around 40% of the total quantity of bio-solids managed annually by the Water Authority. Every cubic yard of bio-solids that is processed into compost by the Water Authority also diverts 1.5 cubic yards of amendment materials as described that would otherwise require disposal in a solid waste landfill.

### **Performance Measures & Results:**

% Biosolids used vs total volume produced: 40%

### **WATER REUSE**

- Board/executive management reuse strategy established

- Communications and outreach plan developed and implemented
  - Investments in reuse infrastructure
- Three water reuse and recycling projects have been constructed. The Industrial Reuse and Non-Potable surface water project has been operational since 2006 and provides non-potable water for irrigation in the northeast heights and north valley of Albuquerque. This project provides up to 3,000 acre-feet per year to irrigate 900 acres parks, golf courses, and other turf areas.
  - The Southside Municipal Effluent Reuse Project (Southside Reuse Project) recycles treated wastewater from the Southside Water Reclamation Plant (SWRP) to irrigate 700 acres of turf at 28 schools, parks, and other recreational areas in the southern part of Albuquerque thereby avoiding the use of high-quality drinking water on public landscapes.
  - Planning a \$400,000 reuse pipeline to the Valle de Oro National Wildlife Refuge and other parks from reclamation plant. This U.S. Fish and Wildlife Service operates refuge is the Southwest’s first urban wildlife refuge and serves as an urban oasis for both wildlife and people.
  - Conducted public outreach on potable water reuse with customers. At four focus group meetings, customers provided input on four reuse scenarios: three indirect and 1 direct. The meeting provided the utility with customer level of support for each of the scenarios and their willing to pay for build a potable reuse system.
  - Three water reuse and recycling projects have been constructed. The Industrial Reuse and Non-Potable surface water project has been operational since 2006 and provides non-potable water for irrigation in the northeast heights and north valley of Albuquerque. This project provides up to 3,000 acre-feet per year to irrigate 900 acres parks, golf courses, and other turf areas.
  - The Southside Municipal Effluent Reuse Project (Southside Reuse Project) recycles treated wastewater from the Southside Water Reclamation Plant (SWRP) to irrigate 700 acres of turf at 28 schools, parks, and other recreational areas in the southern part of Albuquerque thereby avoiding the use of high-quality drinking water on public landscapes.
  - Planning a \$400,000 reuse pipeline to the Valle de Oro National Wildlife Refuge and other parks from reclamation plant. This U.S. Fish and Wildlife Service operates refuge is the Southwest’s first urban wildlife refuge and serves as an urban oasis for both wildlife and people.
  - Conducted public outreach on potable water reuse with customers. At four focus group meetings, customers provided input on four reuse scenarios: three indirect and 1 direct. The meeting provided the utility with customer level of support for each of the scenarios and their willing to pay for build a potable reuse system.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Local Supply	452MG treated for Reuse (offsets potable requirements 1 for 1)
Ratio of reuse quantity vs processed	0.024
Amount of irrigated acreage	1500 acres

## *Alexandria Renew Enterprises VA*



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### **Alexandria Renew Enterprises**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Water Reuse**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Single Plant		
Service Area (square miles): 54	Average annual daily flow (MGD): 35 mgd, designed for 54 mgd	
Population Served: 320,000		
<b>Location</b>		
Street Address: 1500 Eisenhower Avenue		
City: Alexandria Virginia	State:	Zip Code: 22314
<b>Contact Information</b>		
Name: Lisa Van Riper	Phone: 703-549-3381 x 2232	Email: Lisa.VanRiper@alexrenew.com

**NARRATIVE: ALEXANDRIA RENEW ENTERPRISES: A UTILITY OF THE FUTURE TODAY**

Alexandria Renew Enterprises is an advanced water resource recovery facility whose 100 dedicated team members are passionate environmentalists committed to its core mission of protecting public health and the environment. Originally Alexandria Sanitation Authority, AlexRenew was created in 1952 and went into operation in 1956. In 2012, AlexRenew changed its name to one befitting its role in resource recovery and community benefit.

Today, AlexRenew serves more than 320,000 people in Alexandria and parts of Fairfax, Virginia by transforming about 13 billion gallons of wastewater into clean water every year. We operate and maintain 20 miles of interceptors, four remote pump stations, and a state-of-the-art water resource recovery facility.

For eleven consecutive years, we have received the National Association of Clean Water Agencies Peak Performance Platinum Award for our compliance record. This record speaks to our team’s commitment to our core mission, yet we also strive to go above and beyond our permit requirements. Designed to transform 54 million gallons of wastewater per day on an urban 35-acre campus, AlexRenew is one of the smallest gallon per acre facilities in the nation. Being located in a space-constrained urban area within the ecologically sensitive Chesapeake Bay watershed requires a commitment to meet today’s challenges, as well as ingenuity and innovation to enable the future. Recently completed upgrades include sidestream and mainstream deammonification treatment systems. AlexRenew is the first utility in the U.S. to implement a full-scale mainstream deammonification system and the first utility in the world to use this technology to meet very low nitrogen limits.

**ORGANIZATIONAL CULTURE OVERVIEW**

AlexRenew currently employs 100 dedicated public stewards in high and middle skill jobs such as licensed wastewater operators, certified mechanics, licensed electricians, engineers, lab technicians, and more. In the last two years, our operators have logged more than 1600 training hours. Additionally, more than 90% of our maintenance staff are Certified Maintenance & Reliability Technicians. AlexRenew also recently launched a leadership academy for high-potential team members that provides practical leadership and management tools

With the water sector expected to lose up to 50% of its workforce by 2020, we also maintain an apprenticeship program that provides formal career training with academic and hands-on instruction for

skilled technician trades. AlexRenew has hired and trained 13 apprentices over three years in the roles of wastewater systems technician, wastewater mechanic, and control systems technician.

Together, AlexRenew employees are developing a culture focused on collaboration, safety, sustainability, and workplace efficiency. For example, we are training our staff on 5S – an organizational methodology for improving efficiency and effectiveness that started with our maintenance team. AlexRenew’s Safety, Environment, and Sustainability Committee meets monthly to inspect the campus, and interdepartmental teams within the Committee undertake special projects. We have not had a lost-time workplace incident in six years and had zero incidents in 2015.

Innovation is also a primary focus for the AlexRenew team. An objective of our 2040 vision is to implement innovative ideas and technologies to improve resiliency and sustainability. AlexRenew provides opportunities for staff to engage in innovative thinking. For example, workshops are being held with employees across our campus to determine how we will manage biosolids in the future.

We also help every team member realize the importance of their work through internal communications. In celebration of Water and Wastewater Professionals Day, which takes place on June 30, we are creating a team appreciation video. Ongoing efforts include a monthly team newsletter, digital signage, and monthly events that tie into our mission.

#### ***COMMUNITY PARTNERING & ENGAGEMENT OVERVIEW***

By transforming water, AlexRenew helps support the area’s local economy, ensures the community we serve enjoys a higher quality of life, and protects our local waterways, which are a source of beauty, recreation, and commerce.

We work hard to build public trust and understanding of wastewater treatment. This starts with communication methods like our bill stuffer, website, and social media. And, each year, hundreds of people tour AlexRenew’s campus to learn about transforming water firsthand. We engage the community at local schools, community meetings, and events such as Alexandria’s Earth Day. Additionally, we partner with the community on projects like our Urban Wildlife Habitat planting, which showcases native plants and will serve as an outdoor classroom for community groups like Master Naturalists.

We operate an advanced odor control system to ensure that we don’t affect our neighbors. On top of our Nutrient Management Facility, we constructed a lit multipurpose athletic field. And soon, our new LEED Platinum-certified Environmental Center with public meeting space, a customer service center, and educational lobby will open and help foster water awareness and stewardship. AlexRenew constructed the building and adjacent public athletic field through a partnership with the City of Alexandria and developer Carlyle Plaza Partners.

We also partner with researchers at universities, such as George Mason University, and nonprofits like the Water Environment Research Foundation to act as a test bed for wastewater innovations. Our partnership with the community extends to our local emergency services, which train on our campus, and the Alexandria Seaport Foundation, which stores its boats at AlexRenew.

#### ***BENEFICIAL BIOSOLIDS REUSE***

For too long, wastewater biosolids (often called “sludge”) were under appreciated by many, considered a waste by-product of wastewater treatment. AlexRenew has worked for decades, along with the industry as a whole, to change public perceptions and demonstrate that biosolids are a valuable product and not a waste.

In the mid-2000s, AlexRenew implemented a Prepasteurization system that enabled production of Class A Biosolids and production of more methane gas. Through a partnership with Synagro, AlexRenew’s biosolids are land applied at farms in more than 15 counties in Virginia or blended to make George’s Old Town Blend. AlexRenew and Synagro staff participate in AlexRenew’s EMS Program, which includes public outreach, communications, and quality management practices. In 2008, AlexRenew’s biosolids were certified as Class A Exceptional Quality under the National Biosolids Partnership’s EMS Program. AlexRenew has since evolved their EMS program beyond biosolids, and is recognized by Virginia DEQ as an Extraordinary Environmental Enterprise (E4). In 2015, 99.4% of AlexRenew’s biosolids were beneficially reused.

A long range planning study is currently underway that will consider proven and emerging technologies to further optimize production of biosolids and methane gas (energy). The study will be completed later this year, with phased implementation of the endorsed strategy to follow.

AlexRenew is an active member of various organizations that promote beneficial reuse of biosolids, including VAMWA, MABA, and the VBC.

### ***ENERGY EFFICIENCY***

AlexRenew has pursued energy efficiency improvements for more than a decade. Due to a confined footprint and constraints, AlexRenew faces various energy use challenges, including multiple onsite pump stations, and process air compressors for secondary treatment. In the mid-2000s, AlexRenew embraced an ambitious goal: To be a net zero energy user and eventually an energy producer.

Various studies have been conducted to assess and optimize energy use. Early studies led to implementation of energy efficient lighting, installation of more than 25 power monitors onsite, and construction of an adsorption chiller and dual feed boiler systems. In 2015, AlexRenew produced 157 million cubic feet of methane gas and used 92% of it to operate their facilities.

A plant-wide Energy Master Plan Study was completed in 2014, evaluating all existing systems and energy usage and recommending improvements. The master plan is now a guidance document for decision-making related to the plant’s electrical infrastructure and demands.

AlexRenew has designated an onsite energy champion and supporting team that tracks energy usage and promotes improvements. Since 2008, AlexRenew has reduced its annual electrical consumption by 41 million BTUs or 17.3%. AlexRenew has also joined the Department of Energy’s Performance and Better Plants Program to achieve ISO 50001 Energy Management Certification. This is a voluntary commitment of 25% reduction in energy over 10 years.

### ***WATER REUSE***

AlexRenew constructed and commissioned a plant effluent water system in 2002, with a 10.4 mgd capacity. The goal: Offset potable water use to run plant processes and operations. In 2015, 1.4 billion gallons of treated plant effluent were used onsite in lieu of potable water.

A study was conducted in 2014, which included market analysis and feasibility of reclaimed water production, and identified future needs that could be met with a phased implementation plan. Phase 1, completed in 2015, included construction of a 2 mgd pump station, associated pipeline, and onsite bulk filling station. Ultimate buildout through subsequent phases will yield a 5 mgd capacity.

Completion of the Environmental Center in the summer 2016 will include reclaimed water uses for irrigation, cooling tower supply, toilets, an aquarium, biofilter wall, and exterior fountain. Demands will utilize 30 million gallons of reclaimed water annually.

AlexRenew continues to work with Carlyle Plaza Partners to assess their water needs, as they develop an adjacent site to accommodate 1.2 million square feet of residential and commercial use. AlexRenew has designed an extension of their reclaimed water line to serve the Carlyle properties and extend to the Eisenhower Circle.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

AlexRenew has developed a 2020 strategic plan that aligns with our 2040 vision strategic outcomes, which include goals around community benefit, watershed partnerships, operational excellence, incubating new ideas and innovations, enhancing organizational competency, and revenue stewardship.

The 2020 strategic plan outlines initiatives, goals by department, key performance indicators, and targets. These metrics are tracked monthly in senior leadership team meetings and shared with teams. AlexRenew launched its operator and maintenance technician apprenticeship program in 2013. This program provides formal career training with academic and hands-on instruction for skilled technician trades. Additionally, our internship program is also the only year-long program for high school seniors in the Washington, DC area, and it includes formal training and mentoring with our engineers and scientists. We recruit, train, and employ people from high school or college graduation to retirement, and offer programs to ensure our employees are skilled in the latest and best techniques in the industry. In the last 2 years, our operators have logged more than 1600 training hours. Additionally, more than 90% of our maintenance staff are Certified Maintenance & Reliability Technicians.

Initiated in 2016, Alexandria Renew Leadership Academy (ARLA) is an opportunity for emerging leaders to learn from peers across our organization with varying levels of leadership experience. The program provides practical tools that apply immediately to employees' work environment.

AlexRenew provides opportunities for staff to engage in process decisions and encourages innovative thinking. For example, workshops are being held with employees across our campus to determine how we manage biosolids in the future. We also hold meetings with our apprentices to get their insights about the future of our apprentice program. In 2012, AlexRenew changed its name from Alexandria Sanitation Authority to Alexandria Renew Enterprises (AlexRenew) and rebranded to better convey our role in resource recovery and community development. As we elevate our brand, taking AlexRenew from a standard utility to a place of transformation, we also elevate the internal culture. The brand helps every associate realize the importance of their work.

AlexRenew focuses on internal communications that reinforce the value of wastewater treatment and resource recovery with a monthly internal newsletter, monthly CEO roundtables, cascading messaging, and digital signage across campus. AlexRenew also hosts events and celebrations each month that tie into our mission, from Safety Month activities to an Earth Day luncheon.

AlexRenew is committed to workplace safety: we have not had a lost-time workplace incident in six years and had zero incidents in 2015. AlexRenew has a Safety, Environmental & Sustainability committee that meets monthly to inspect the campus and organize special projects. AlexRenew also conducts ongoing safety training programs and partners with the Virginia Municipal League on some programs like the driver safety program, "Where the Rubber Meets the Road" and have 5 certified staff who perform this training.

AlexRenew is committed to finding and fixing inefficiencies. For example, our maintenance shop and laboratory are organized according to 5S methodology for efficiency and effectiveness. AlexRenew is conducting 5S training across the organization, and all employees will participate in this work.

AlexRenew fosters a culture of financial sustainability and stewardship for ratepayer funds. Although plant flows have remained relatively constant, BOD and TSS concentrations have increased and the cost to treat water and maintain our infrastructure continues to increase. We are continuously looking for innovative ways to improve energy efficiency, use fewer resources, and reduce or recover costs in other ways.

AlexRenew conducted comprehensive Long Range Planning Activities in 2008-09, to address current and future needs and enable AlexRenew's mission and vision through 2030. In 2016, an update to the Long Range Planning process began, focused on solids treatment enhancements, with a planning horizon of 2040. Both planning efforts, which define and shape capital improvements, have included AlexRenew operations & maintenance, engineering, and management staff. Long Range Planning (LRP) More than 30 staff members, across operations and maintenance, engineering, and management have participated in past and ongoing LRP efforts which has maximized stakeholder input and endorsement. Operator Training In the last 2 years, our operators have logged more than 1,600 training hours. Between Q3 2015 and Q2 2016, Operations staff were trained on 21 modules covering all main plant site and remote pump station processes. Operators, trained by consultants, will become the owners of the module material moving forward and train new staff in the future.



Additionally, more than 90% of our maintenance staff are Certified Maintenance & Reliability Technicians. Safety Commitment AlexRenew has not had a lost-time workplace incident in six years and had zero incidents in 2015. Maintenance Efficiency Our maintenance shop is organized according to 5S methodology for efficiency and effectiveness. AlexRenew is conducting 5S training across the organization, and all employees will participate in this work.

#### *Performance Measure(s), Results*

Long Range Planning (LRP) More than 30 staff members, across operations and maintenance, engineering, and management have participated in past and ongoing LRP efforts which has maximized stakeholder input and endorsement. Operator Training In the last 2 years, our operators have logged more than 1,600 training hours. Between Q3 2015 and Q2 2016, Operations staff were trained on 21 modules covering all main plant site and remote pump station processes. Operators, trained by consultants, will become the owners of the module material moving forward and train new staff in the future.

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#### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use
- Adequate staffing for biosolids program internally and externally (Synagro). External contractor is required by contract to participate in AlexRenew's EMS program including public outreach, communications, and quality management practices.

AlexRenew's EMS Program, originally started in accordance with NBP EMS in 2008, has since evolved with the organization – and currently AlexRenew is recognized by Virginia DEQ as an E4 enterprise (Extraordinary Environmental Enterprise) based on their EMS. Environmental Management System in place which includes goals and objectives related to biosolids. AlexRenew produces a blended biosolids product (George's Old Town Blend) in coordination with Synagro, as well as land application of biosolids.

AlexRenew has consistently produced Class A Biosolids for more than 8 years, and maintains a goal of 100% beneficial reuse of all biosolids. A Long Range Planning Study is currently underway to analyze and optimize biosolids production. The work will consider all available, proven and emerging technologies to reduce biosolids production as well as generate energy and other products. The study will be completed by end of Q3 2016, with phased implementation of the endorsed strategy to follow. Active participation

in Virginia Association of Municipal Wastewater Agencies (VAMWA), Mid-Atlantic Biosolids Association, and Virginia Biosolids Council on biosolids issues.

#### *Performance Measure(s), Results*

- Percent of biosolids beneficially used vs. produced (annual basis) In 2015 (from 503 report), AlexRenew produced 5,629 dry metric tons (DMT) of biosolids; 5,026 DMT were land applied; 570 DMT were used as a blended product; 33 DMT were landfilled. Net of 99.4% beneficial reuse of AlexRenew biosolids.
- Natural resources conserved through substitution with biosolids Average monthly TKN (mg/kg) in biosolids for 2015: 54,708 Average % solids: 28.4%
- Tons of carbon sequestered in soil via land application of Class A biosolids In 2015, 903 Metric Tons of CO2 equivalents External Certification/Recognition
- In 2008-2015 period, AlexRenew was certified through the National Biosolids Partnership (NBP) EMS Program.
- 2013-2015: Based on their EMS Program, AlexRenew was certified as an Exemplary Environmental Enterprise (E3) by Virginia DEQ. In 2016, AlexRenew was certified as an Extraordinary Environmental Enterprise (E4)

#### **COMMUNITY PARTNERING AND ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Each year, hundreds of people tour AlexRenew's campus to learn about transforming water firsthand. We also engage with the community at local events, schools, community meetings, and through community projects. Through a partnership with the City of Alexandria and developer Carlyle Plaza Partners, AlexRenew constructed a LEED Platinum Environmental Center and athletic field.

The building features an educational lobby with museum-quality exhibits, a classroom for outreach activities, and public meeting space. Adjacent to the Environmental Center is Limerick Street Field, a full-size turf field that sits atop our 18-million-gallon nutrient management facility. AlexRenew is proud to support our local emergency services by providing training space onsite for fire and police personnel. We also offer boat storage to the Alexandria Seaport Foundation, a nonprofit serving at-risk youth and honoring Alexandria's maritime heritage.

AlexRenew partners with researchers at local universities and national nonprofits to be a test bed for wastewater innovations. For example, Alexandria Renew in partnership with George Mason University

(GMU), is conducting an ecological study of Hunting Creek, a tributary to the Potomac River. The goal of the study is to provide trend analysis of the ecosystems receiving clean water from our facilities.

AlexRenew, in collaboration with Earth Sangha, Master Naturalists, Master Gardeners, and Audubon at Home, created an urban wildlife habitat on our campus with 900 native plants. The habitat beautifies the AlexRenew campus, showcases native plants, and will be an outdoor classroom for community groups. AlexRenew's mascot, Moxie, is a nitrogen-eating hero and STEAM (Science, Technology, Engineering, Arts, Math) ambassador who teaches children about the value of water. We have developed a variety of Moxie materials, including a moxie workbook, costume, and photo booth, focused on our K-8 audience.

In 2015, AlexRenew launched a redesigned website that makes it easier for customers to pay their bill and engage with us online. Website visitors can learn about what we do, and request a tour to learn more. We keep the site updated weekly with articles about our Team, projects, and more. AlexRenew is active on Twitter, with more than 2,000 followers, and on Facebook, with nearly 1,800 likes. Social media provides the opportunity to engage with our community in a two-way dialogue. We feature our team, our process, and the significant role of the wastewater sector in protecting public health and the environment.

#### *Performance Measures & Results*

Partnership – City of Alexandria AlexRenew has an active partnership with the City of Alexandria in development of their long term control plan update (for wet weather). Various studies have been executed to model and evaluate the collection system and responses to wet weather. AlexRenew also supports City events including Earth Day, with a large booth, a seat on the steering community, and the Ellen Pickering Award for Environmental Excellence. Partnership – Carlyle Plaza Partners (CP2)

AlexRenew also has an ongoing partnership with CP2, which includes not only development of the West Plant Site but also considers use of reclaimed water and other AlexRenew Products. Partnership Awards Received NACWA NEAA 2016 Utility of the Future Award, recognizing partnership with the City of Alexandria and Carlyle Plaza Partners to develop the West Plant Site.

Communications/Media: AlexRenew is active on Twitter, with more than 2,000 followers, and on Facebook, with nearly 1,800 likes. AlexRenew maintains a robust website, and issues routine newsletters and press releases.

Monthly bill inserts are also used to inform customers of upcoming events that will affect them, as well as water stewardship tips, and major milestones/accomplishments achieved. Recovered Green Space Provision of the Limerick Athletic field as part of a recent plant expansion, directly on top of process tankage, not only recovered a historic landfill site but also provides a full-size athletic field for the community for multi-sport use.

AlexRenew also recently, in partnership with three Alexandria-area organizations, planted an urban wildlife habitat on its campus in May 2016 with 1000 native plants. Volunteers from Cooperative Extension, Audubon at Home, and Earth Sangha worked side by side with AlexRenew volunteers to plan and plant the habitat.

Website Statistics: The AlexRenew website, since it has been redesigned, has gotten more traffic than ever. Every month we receive an average of 18,000 page views from 3,500 users. In addition, our bounce rate is less than 40%, and we have an average of 350 customers set up online accounts with us every month at alexrenew.com.

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Plant wide installation of more than 25 power monitors to monitor and evaluate energy usage. Energy efficient lighting (motion activated) throughout the plant was also installed. Conducted Building Energy Analysis (HVAC Systems) and benchmarking for 7 major occupied facilities on the project site in 2016. Subsequent actions to be taken are pending. Conducted Plant Wide Energy Master Plan Study in 2014.

The purpose of the plan was to create a guidance document that could be used to inform decision making related to the plant's electrical infrastructure, as well as decisions regarding sustainable electricity supply and energy savings initiatives. The plan evaluated all existing systems and energy usage, and made recommendations for future improvements – both capital and O&M. Ongoing analysis of Process Air Compressors (Blowers) used for Secondary Treatment. The emphasis of the study is to maximize blower efficiency and energy usage. Study will be concluded in 2016. Joined the Department of Energy's Superior Energy Performance and Better Plants programs to achieve ISO 50001 Energy Management Certification. This is a voluntary commitment of 25% reduction in energy over 10 years. We have one of the first sidestream deammonification operations in the country operating on our campus, and are currently commissioning the first mainstream deammonification operation in the country. Using deammonification reduces energy use by approximately 25%.

### *Performance Measures & Results*

Energy efficiency analysis for all capital projects Custom decision model used by AlexRenew requires analysis and weighting for projected energy use for projects relative to existing baseline. Higher points/scores are awarded to more energy efficient options.

AlexRenew maintains a long-term goal of being a net zero energy user. Overall reduction in plant energy usage (Electric and Gas combined reported in M-BTU) Baseline CY 2008 = 236,889 M-BTU Present CY 2015 = 195,721 M-BTU Overall reduction = 41,168 M-BTU or 17.3 % reduction (data was normalized by yearly flow based on VEEP DEQ reporting metrics) Implementation of energy efficient Deammonification systems Implementation of sidestream and mainstream Deammonification processes in 2015 and 2016,

respectively, will reduce aeration needed for treatment by approximately 2,500 MWh/yr. Energy savings, once all systems are optimized, is projected at \$157,500 annually based on 6.3 cents per KWH.

Methane Gas Production and Use Use of absorption chiller and dual feed boiler systems onsite to utilize methane gas produced by digestion processes. In 2015, produced 157 million cubic feet of methane gas and used 92% of it to operate plant facilities, offsetting external energy needs.

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure

Onsite reuse of plant effluent water to defray use of potable water and associated costs. Design and construction of Phase 1 of Reclaimed Water System for external users, with capacity of 2 million gallons per day (mgd). Future buildout phases allow growth of system to 5 mgd. Ongoing review and coordination with potential partners for reclaimed water usage, including neighboring Carlyle Plaza Partners development and other planned developments in East Eisenhower Corridor. Planned extension of Reclaimed Water Line to Eisenhower Circle in progress (permitting phase).

### *Performance Measures & Results*

Onsite Water Reuse AlexRenew utilizes more than 1.4 billion gallons per year of plant effluent water onsite for various plant processes, in lieu of potable water. Reclaimed Water Usage A new reclaimed water system has been designed in phases, with the first phase complete (2 mgd capacity). Ultimate buildout will push capacity to 5 mgd.

In addition to development of adjacent residential/commercial users, a bulk fill station has also been provided onsite. Planned 2016 Reclaimed Water Demands AlexRenew's Environmental Center, scheduled to be completed in Summer 2016, is projected to utilize a total of 105,000 gpd. Uses include irrigation, cooling tower supply, toilets, a large aquarium, a biofilter wall, and an exterior water fountain feature.

## Avon Lake Regional Water OH



### Avon Lake Regional Water OH

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Community Partnering & Engagement

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Collection system with single plant		
Service Area (square miles): 11.2 + bulk customer area	Average annual daily flow (MGD): 5	
Population Served: 23,000 direct customers + 7,000 through bulk connections.		
Location		
Street Address: 201 Miller Road		
City: Avon Lake	State: OH	Zip Code: 44012
Contact Information		
Name: Todd Danielson	Phone: 440-933-6226	Email: tdanielson@avonlakewater.org

**NARRATIVE:** Martin Luther King, Jr. said, "We are not makers of history. We are made by history." Paradoxically, this quote about history is also the basis for Utilities of the Future. Utilities were formed to provide a public good—to benefit public health and the environment, while also improving the economy. These are the same foundational roots of the Utilities of the Future.

Avon Lake Regional Water was founded 90 years ago and has historically employed people with the classic, small-town, Midwestern value of neighbors helping neighbors. This is still the case today, regardless of whether it is our distribution and collection crew responding to a basement backup, our customer service staff answering a customer's question on the phone, our engineering staff designing a replacement sewer, or our communications personnel posting information to Facebook.

With a 40-person staff that reports to an independently elected Board of Municipal Utilities, the organization has always tried to provide a high level of service to our customers. Now, in the midst of \$100 million in capital expenditures to replace aging infrastructure and separate combined sewers, staff is focused on providing the best value to customers. In 2015, executive staff worked with the Board and a facilitator to develop the organization's Mission, Vision, and Guiding Principles. Senior staff then worked together to establish the organization's major initiatives, which were then approved by the Board. By aligning around these initiatives, staff is able to focus resources on the most pressing issues.

The chief executive works closely with internal and external stakeholders to help better the community and the organization. A major focus is the current investment in combined sewer separations and our wastewater plant's rehabilitation to help prepare for its transformation into a water resource recovery facility. With these major initiatives, we have reached out to the community in many ways to help build support. In 2013, we launched our Water Warriors program, through which we provide tours of our water and wastewater facilities for the fifth graders in Avon Lake and conduct lab experiments with them to help them gain a better understanding about how we impact Lake Erie and are impacted by it. In 2014, we expanded our outreach even more by hosting the first annual Lake Erie WaterFest—a party with a purpose to help inform people about our lake, how we impact it, and how we can enjoy it. This festival has historically been completed in conjunction with a local non-profit called Friends of the Parks and the partnership has been expanded in 2016 to include Ohio State University's Stone Laboratory and Ohio Sea Grant. In 2015, the outreach efforts were folded under an umbrella, called our Love Your Lake campaign, which helps our customers further strengthen their affinity for the lake and support the things we do to protect it.

One area where we have had great success engaging with the community is through social media. We have presence on Twitter, YouTube, Instagram, LinkedIn, and Facebook and regularly interact with customer groups through email. Each outlet attracts a different type of follower, and we have had the best luck on Facebook for direct interaction with customers. Our following exploded when we experienced an icing event in 2014 on the intakes of our water plant, and our following has continued to grow steadily. We provide information about projects and events, as well as pictures and items about Lake Erie and other topics of interest.

As we have been separating sewers in neighborhoods, we have made use of email groups to provide regular updates about the projects. Interested parties sign up to be on a specific distribution list for a particular project. Through that list, we send regular updates regarding project status and what to expect. People can "reply" to the emails if they have specific questions or concerns. The lists have

helped our customers understand we care about how they are impacted by the projects we undertake on their behalf and are grateful to know when to expect the road in front of their house will be dug up.

Our roots and Midwestern value of neighbors helping neighbors have been an excellent foundation on which to build our communications and outreach platform to help more people in our community know about us, interact with us, and support what we do. As we are able to move our focus from sewer separations to other endeavors, this foundation will also support development of new business areas such as collection of fats, oils, and greases or off-spec foods for energy production; a public-private partnership with a greenhouse company to lease land for greenhouses, provide reclaimed water for irrigation, and heat to maintain wintertime production; and/or a business arrangement where we repurpose an old monofill to serve as wintertime biosolids storage for other jurisdictions. We are enjoying the present and the services we provide and look forward to the future to achieve our vision of being "a trusted and treasured community asset that enhances quality of life."

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation

In 2015, we created the outline for our first staff-led strategic plan, which outlines the major initiatives we want to undertake. Senior management worked with the Board to develop the mission, vision, and guiding principles. All requests to the Board refer to the initiatives and/or guiding principles.

The organization is attempting to implement several new projects/programs/offerings. Individual staff members bring the ideas to a group that then discusses whether we think it could be implemented. With the green light, the staff member develops it into something for final approval.

## **COMMUNITY PARTNERING & ENGAGEMENT**

Community partnering is collaboration with local organizations and other 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 community or communities it serves. Community engagement is the interaction with customers and other local stakeholders to provide ongoing opportunities for dialog along with communication and education related to utility operations and the value of water and utility services. Under Community Partnering & Engagement, the utility proactively engages with stakeholders and community decision makers to promote the utility as a valued, competent, and trustworthy community asset.

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)



- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)

We are in the midst of planning our third annual Lake Erie WaterFest—a partnership with the City of Avon Lake and, now, Ohio State University's Stone Laboratory to promote the value of Lake Erie and how we both use it and can impact it. The event drew about 1,000 the first year and 1,200 the second year.

#### *Performance Measures & Results*

- Troy Water Warriors (school education): Expose ~325 5th grade students/year to our water & wastewater plants and conduct lab experiments with them
- Community Tours: Provided tours to Girl Scouts, Boy Scouts, Home Schools and other groups during the past 12 months (62 students, plus chaperones in 2016 from Jan thru May)
- Facebook: 2,647 Likes as of 5/2/16, up from 2,463 Likes 5/5/15
- Twitter: 1,231 followers as of 5/2/16

## **Baltimore City Department of Public Works MD**



### **Baltimore City Department of Public Works MD**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Watershed Stewardship**
- ★ **Integrated Growth Planning**

<b>Utility Description (combine all plants if a multi-site system)</b>		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): <b>Baltimore City DPW has 2 Wastewater Treatment Plants.</b>		
Service Area (square miles): <b>324 sq. miles (184 sq miles at Patapsco and 140 sq. miles at Back River.)</b>	Average annual daily flow (MGD): <b>250 MGD</b>	
Population Served: <b>Over 1.8 million</b>		
<b>Location</b>		
Street Address: <b>Room 600, Abel Wolman Municipal Building, 200 Holliday Street</b>		
City: <b>Baltimore</b>	State: <b>Maryland</b>	Zip Code: <b>21202</b>
<b>Contact Information</b>		
Name: <b>Jeffrey Raymond</b>	Phone: <b>410-545-6541</b>	Email: <b>Jeffrey.Raymond@baltimorecity.gov</b>

**NARRATIVE:** More than any other agency in the Baltimore Metropolitan Area, the Department of Public Works provides the most vital services. We produce and distribute high quality drinking water, we take away and clean wastewater, and we collect and dispose of solid waste. We have been doing this work, successfully, for generations. We are always getting better at what we do.

Take a moment to imagine the state of our region without these services that touch the lives of 1.8 million people every day. We are at the forefront in protecting public health and, without exaggeration, we provide life itself.

Background: The Baltimore City Department of Public Works (DPW), a city government agency, is divided into ten internal divisions plus two bureaus: the Bureau of Solid Waste and the Bureau of Water and Wastewater. In order to assure this public agency operates with a business mentality, two years ago we created an Office of Strategy and Performance. It is the role of this small but important part of the DPW Director’s team to ensure all the divisions are working toward the agency’s overall goals. It assembled teams of employees from every function area and every rank to identify how DPW may achieve its goals, using best practices and measurable outcomes.

We provide drinking water to 1.8 million people in the Baltimore region. We operate three water filtration facilities, and manage three raw-water reservoirs and their surrounding lands.

DPW has two wastewater treatment plants, and they are among the largest on the east coast. These facilities treat approximately 250 million gallons of wastewater daily. The plants serve 1.8 million wastewater customers in the Baltimore Metropolitan Area.

In September 2015 the City celebrated the centennial of our first water treatment plant - Montebello I. When it was constructed it was state-of-the-art and the culmination of a century-long effort to provide quality water in plentiful quantity from a reliable source.

While DPW used that celebration to praise the wise leaders of the past, we also used it to display and discuss the work we are doing now, as well as our plans for the future. A living agency, operating around-the-clock, cannot stay in the past, nor can it stop moving forward.

Baltimore's water capital improvement plan is estimated at \$1.3 billion over the next six years. Much of that will be used to fund our aggressive 15 mile/year replacement or rehabilitation of the City's water mains, many of which are over 100 years in age.

Preventive inspections and replacement of failing sections of large water mains is ongoing. For this task we use the latest technologies which enable us to prevent catastrophic failures.

In addition to water line renewal, Baltimore will be rehabilitating the Vernon, Cromwell, Pikesville, Towson, Ashburton, and Guilford Pumping Stations. Needed improvements will be made to the Montebello Water Filtration Plants, and a new water treatment plant is being designed for Fullerton. Mandated work was recently completed on covering the Montebello II and Towson Finished Drinking Water Reservoirs. Covering of our open finished drinking water reservoirs at Lake Ashburton and Druid Lake is in the near future, and work is now underway at Guilford Reservoir.

The wastewater capital improvement plan is \$701.1 million over the next six years. Collapses and blockages in sewer lines lead to overflows into nearby streams and basement backups. Baltimore continues its work in rehabilitating underground sewer infrastructure as required by a federal/state Consent Decree. Baltimore was among the first cities in the nation to enter into a Consent Decree, in 2002, to rebuild its aging and leaking sewer collection system. After years of study, engineering, and construction the tasks were left unfinished, however. On June 1, 2016, federal and state regulators filed a modified Consent Decree that not only provides a framework for the completion of the work, but also insists on further upsizing of its sewer collection system and provides for ongoing maintenance and regulatory oversight for more than a decade.

Wastewater projects include regulatory driven Enhanced Nutrient Removal at both wastewater treatment plants, numerous upgrades at Back River Wastewater Treatment Plant, and the Back River Headworks project that will reduce the volume of sewer overflows by more than 80 percent.

Baltimore is also nearing completion of the BaltiMeter installations to ensure accurate and timely water meter reading using AMI technology. This is coupled with a new BaltiMeter Billing system which will go into effect in October. Customers will be better able to track their water usage, and make more informed decisions about water use and looking for water leaks.

Baltimore collects the funding to pay for the work required by its Metropolitan Separate Storm Sewer System (MS4) permit through a fee assessed on impervious surfaces. Stream restoration projects, storm drain inlet cleaning, and public-private partnerships that promote clean water, all help the City move toward its goal of restoring 20 percent of its impervious surface area. We have made important strides in reducing trash in our waterways, partly through the new initiative of installing screens in storm inlets.

The DPW Bureau of Solid Waste collects trash and recycling from about 200,000 city households. It provides services that include recycling, bulk trash pickup and household hazardous waste collection. In 2016 large, durable, wheeled municipal trash cans with attached lids were delivered to virtually every household in the City. This is an important step in rat infestation prevention and in keeping trash off the streets and out of streams and storm drains.

One relatively new addition to the Department is the Office of Sustainable Energy (OSE). This division is responsible for purchasing energy for City government buildings, vehicles and equipment. It also works to be sure energy is used as efficiently as possible, and looks for opportunities to generate renewable

energy. Examples of those efficiencies can be found at the co-generation plant and solar arrays at Back River.

In order to get the lowest price for energy and to capture fuel opportunities for the City, OSE participates in collaborative purchasing, fuel supply contracts, and audits of City utility bills. Baltimore City government participates in the utility demand response program. When the City cuts back its draw from the electric grid during the hottest days of the year, we earn credits. This OSE initiative is saving the City money on our utility bills.

The work we are doing at Public Works has garnered regional and national attention. Among recent recognitions are the following:

- June: DPW's Nathaniel Krause awarded 2016 Young Engineer of the Year from the Maryland Section of the American Society of Civil Engineers
- April: Utility Manager of the Year (Large Utility), Rudolph S. Chow, P.E., DPW Director, by the Chesapeake Utility Corporation.
- February: Top 10 Friendliest Cities for Electric Vehicles in the United States by The Smart Grid Consumer Collaborative.
- February: Baltimore received three major regional engineering awards from the American Council of Engineering Companies (ACEC), Maryland Chapter for "Innovative Excellence in Engineering Design" for the following projects: the Rehabilitation of the Southwest Diversion Pressure/Gravity Sewer, Phase III, the Towson Finished Water Reservoir, and the Montebello Plant 2 Finished Water Reservoir.
- January: Baltimore was ranked number 3 in plug-in electric vehicle readiness in U.S. cities as a result of a study by the Indiana University School of Public and Environmental Affairs. The study was published in Electricity Journal in 2016.

In addition, this spring Baltimore once again won regional recognition for the best water in its region. Baltimore water customers already know the high quality of our water. But behind the tap are workers, innovations, capital projects and a vision to ensure that future generations will have that same water quality and reliability. We are an agency with a proud past, a progressive present, and a promising future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees

Creation of Strategic Plan utilizing broad employee participation with a vision, mission, and values as well as areas to improve immediately and in the future.

Creation of Six Focused Goal Areas and Goal Teams with internal stakeholders with measurable objectives to make measurable progress in each of the six goal teams.

Creation of the Office of Strategy and Performance, an internal collaborative entity charged with ensuring that strategic thinking and longer term perspectives are applied, accomplished, and monitored throughout DPW with single-minded focus on advancing the Strategic Plan.

Organizational Lean Training in order to foster understanding of the benefit of applying Lean tools and methodology.

Goal Tactic Quarterly Updates in order to report tactic progress, receive stakeholder feedback, and brainstorm on obstacles and opportunities.

### *Performance Measures & Results*

Strategic Plan, Vision, Mission, and Values and Goal Area and Team set up created in 2014

Created over several months during 19 meetings with more than 150 employees throughout the Department of Public Works and an external consultant.

The Strategic Plan Goal Areas were broken out into tasks, then organized into tactics and assigned timeframes: short-term (1 year), medium-term (1-3 years), and long-term (3-5 years). As an additional measure to ensure the steady progress toward tactic completion, Goal Teams were created. Goal Team Focus Areas and Objectives:

Goal Team Focus Areas and Objectives: Customer Satisfaction & Communications: To improve customer service, satisfaction, and engagement

Environment & Public Health: To enhance the quality of life by improving the cleanliness and health of Baltimore's environment

Financial Sustainability: To assure financial viability

Human Capital Management: To attract, develop, and retain a professional and highly skilled workforce

Infrastructure Renewal: To manage infrastructure assets in a proactive and fiscally responsible manner; and

Organizational & Process Optimization: To enhance organizational efficiency through business process improvement

Strategic Plan Tactic Completion through the Goal Teams

White papers, recommendations and completion of 12 short-term tactics. On track with 34 medium- and long-term tactics.

Quarterly tactic reports to stakeholders June 30, 2016 will be the seventh quarterly report to 120 stakeholders from across the organization. Each report out is to a minimum of 80 people and involves discussion, suggestions, feedback and revision of tactics as voted upon.

Organizational Lean Training Lean Training through Operational Performance Solutions, Inc. To date, 180 employees have completed Beginner Lean, 9 have completed intermediate, and 4 are currently in advanced training (with the goal to become trainers themselves).

## **BENEFICIAL BIOSOLIDS USE**

- Business case evaluation conducted for beneficial biosolids use program
- Participation in or certification in National Biosolids Partnership or ISO programs

There is currently a new Biosolids Masterplan being conducted for the City of Baltimore, Wastewater Facilities Division, to evaluate the best business cases for the beneficial use of Biosolids for the future. This plan is expected to be complete in 2017.

The City of Baltimore currently contracts with two separate companies to process our sludge disposal needs. One company uses two different heat drying processes to produce a fertilizer pellet from the residual biosolids. This product is used as a commercial fertilizer and also as a fuel source for a cement production facility. The second company operates a composting facility and produces high quality commercial compost. This product is applied to commercial and residential facilities. The City of Baltimore participates in National and Regional Biosolids partnerships. A representative attended the 2016 WEF/WERF Biosolids and Residuals conference. In addition, the City of Baltimore is hosting the 2016 MidAtlantic Biosolids Association's Summer Technical Symposium.

### *Performance Measures & Results*

Baltimore produces 83,682.64 tons of residential sewage sludge. The biosolids produced by Baltimore City are beneficially used on an annual basis by the two private companies, see above.

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Provide grants to nonprofit organizations for up to 100% of a project's costs for watershed restoration and rehabilitation projects relating to: 1. Planning, design, and construction of stormwater management practices; 2. Stream and wetland restoration; and 3. Public education and outreach related to stormwater management or stream and wetland restoration. Provide assistance and funding for the new Clean City Guide, and to assist nonprofit clean partners like the Baltimore Corps. Community

liaisons regularly meet with neighborhood associations, attend local and regional festivals, and make presentations in schools in order to educate residents on the utility and various projects and programs in place.

### *Performance Measures & Results*

Provide community assistance for the Mayor's Spring and Fall popular community cleanups. Large amounts of debris tonnage collected by the City for each cleanup; heavy community participation.

Mountain biking at the Loch Raven Reservoir

DPW has a stewardship agreement with mountain biking groups governing recreational use of the reservoir area for bicyclists.

DPW Social media DPW includes community groups and nonprofits in all outreach including press releases and literature, publication dissemination. The DPW Facebook page has 2,316 likes; Twitter has 6,226 followers. DPW was the first city agency to use NextDoor, a private social network for neighborhood communities, has a reach of 33,629 residents in Baltimore City. The reach totals 66,483 residents both Baltimore City and Baltimore County-wide.

Activities to promote partnership, education and outreach In addition to press contact and social media, DPW presents yearly events to educate residents and provide tours and other hands on activity. These events include the Montebello Centennial in 2015, Big Truck Day and the Dam Jam at the Loch Raven Reservoir in 2016. We join and have our partners join us where possible for all events Our partnerships are mentioned throughout this application.

## **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy efficiency team established and empowered to implement master plan and communicate results to management and staff

Energy performance contracts (EPCs) or other similar mechanisms in place evaluated and in place, where appropriate. The City has implemented \$140 million in EPCs since 2006 and commit time to continuously assess their performance – with net savings over the contract life of more than \$35 million.

Utilization of energy conserving equipment wherever possible. The City has received a grant and is in the process of procuring a real-time energy management dashboard built on interval data to 40 sites, which



will support behavioral energy conservation for peak reduction including many pumping stations. This platform will also provide data to identify and design new energy conservation measures.

The City is also leading the country in development of electric vehicle infrastructure – and is currently piloting electric vehicles with agencies across City agencies to determine the most efficient and effective users.

### *Performance Measures & Results*

KWh reductions in site energy use Since 2006, the City has reduced electricity use from city operations by 40 million kWh, which is a 12% reduction. Since 2006, the City has reduced energy use of its water distribution and water/wastewater treatment system by 12% - including pumping stations, chlorination and treatment plants.

#### Reduction in GHG emissions from grid electricity

Since 2006, the City has reduced greenhouse gas emissions from city operations by 25%, or almost 60,000 MT CO<sub>2</sub>-equivalent. This reduction was achieved through energy reduction and lower intensity of GHG emissions from the grid.

#### Current investment in energy efficiency projects and anticipated savings over the life of the contract

Since 2006, the City has invested more than \$140 million in energy efficiency and production projects across government operations (\$34 million for water and wastewater). These projects over their lifetime have a net savings of \$34 million, after debt service and operating costs.

#### Reduction of petroleum use for transportation

Since 2012, we have improved petroleum transportation fuel use efficiency (miles per gallon) by 4% through introducing a new means of financing the purchase of vehicles and reducing the age of the fleet from eight to six years. We have installed over 100 electric vehicle (EV) charging stations to have the infrastructure in place to replace non-emergency sedans with EVs in the next years.

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Co-generation systems. The City is accelerating use of combined heat and power across the water and wastewater operations

Conduct or participation in research activities. The City is testing new ways to use heat generated by CHP by pre-heating sludge lines to the digester.

Conduct or participation in research activities. The City hosts HyTek Bio, which is testing the conversion of stack CO<sub>2</sub> emissions from the cogeneration facility at a wastewater treatment facility to marketable algae-based products.

*Conduct or participation in research activities. The City will be demonstrating battery storage systems combined with CHP and electric vehicle chargers for improved reliability and revenue generation.*

#### *Performance Measures & Results*

Since 2006, the City has reduced its non-renewable energy use by 12% and reduced its carbon footprint by 25%, measured by grid electricity.

Increase in use of solar and renewable energy sources to reduce reliance on the power grid

In 2014, the City had only a 1 MW solar plant at a wastewater treatment facility. In 2016, the City had 11 MW of solar – 1 MW behind the meter at the WWTP and 10 MW purchased through a virtual aggregate net metering agreement with Constellation. This 10 MW net metering deal will save \$11 million over 15 years. The 10 MW solar project will reduce the energy use from the grid by an additional 14 million kWh per year for a total of 54 million kWh reduction or 14%. The City is developing a solicitation for an additional up to 5 MW on landfills and is evaluating opportunities that could reach an additional 10 to 30 MW.

Increase in use of cogeneration to reduce reliance on the power grid.

The City currently operates three 1 MW generators using digester methane gas at a wastewater treatment facility. The City is in the process of developing an additional 10 MW of cogeneration, largely reliant on natural gas.

Purchase of renewable energy credits In 2015, the City purchased renewable energy credits to cover 13% of its electricity use and has a goal of 18% by 2020.

Anticipated investment in energy efficiency The City is investing \$5 million in combined heat and power for the water and wastewater operations, with savings of \$700,000 projects and anticipated savings per year.

#### **WATERSHED STEWARDSHIP**

- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)

- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

The MS4 and TMDL Watershed Implementation Plan (WIP) presents strategies to meet the 20% impervious restoration requirement and Total Maximum Daily Load (TMDL) waste load allocations for each receiving water body. The complete plan is available on DPW's website at [cleanwater.org](http://cleanwater.org) website. DPW established a reporting framework that will be used for annual reporting as required in the City's National Pollutant Discharge Elimination System (NPDES) MS4 Permit. DPW identifies and conducts necessary maintenance, adaptive management, staffing, and financial strategies to implement the WIP.

DPW provides Best Management Practices (BMPs) to restore an equivalent 20% of the existing impervious area where stormwater runoff is currently not managed to the maximum extent practicable (MEP). DPW will continue to educate and involve residents, businesses, and stakeholder groups in achieving measurable water quality improvements.

### *Performance Measures & Results*

The City's proposed approach for meeting the 20% restoration requirements will account for significant reductions of nitrogen, sediment and phosphorus. The majority of the construction work will be completed in the last 18 months of the permit period from July 2017 to December 2018.

To meet the 20% restoration goal, the City will restore over 4,291 acres of impervious surface area by the end of the current permit period, using a diverse approach throughout the City. This will include installing stormwater management projects, employing a variety of operational programs, such as mechanical street sweeping, preventive inlet cleaning, and illicit discharge detection and elimination; and fostering partnerships to encourage stormwater management implementation on private lands, coupled with an increase in environmental stewardship within the communities.

In November of 2014, the Baltimore City Department of Public Works (DPW) created the Stormwater Advisory Committee (SWAC). The purpose of SWAC is to advise the Department on stormwater projects, programs, and issues, and to help educate stakeholder groups on related matters. To date the Advisory Committee has reviewed and provided comment on:

- The City's Municipal Separate Storm Sewer System (MS4) Watershed Implementation Plan, which guides DPW's capital improvement projects for stormwater management and stream restoration;
- Stormwater fee regulations for port industries; SWAC is made up of volunteer members representing a diversity of sectors, including environmental non-profits, businesses and industries, anchor institutions and citizens.
- Proposed changes to the State's stormwater fee legislation; -DPW's stormwater utility fund and how stormwater fees are used to improve water quality; and on
- the Clean Water Baltimore website and associated educational material.

In January 2015, DPW and the Mayor's Office of Employment Development, together with the Chesapeake Water Environment Association (CWEA), launched the Baltimore City Water Industry Career Mentoring Program.

Fifteen (15) people have successfully completed the program and been hired by DPW. A new group of mentees began training in February 2016. This is a seven-month, no cost water mentoring program. The program goal is to educate local young adults about the water industry and its career opportunities; and to develop a pipeline of future workers with the right skills to fill entry level positions in the water industry.

DPW continues to allow property owners who pay a stormwater fee to save money on the stormwater fee by volunteering in a Maryland Stormwater Participation Event.

Stormwater participation events specifically target projects within Baltimore City that improve water quality, such as a community trash clean-up, stream clean-up, tree plantings and installing rain gardens on community lots. In addition to helping the City reduce the polluted stormwater that flows into our storm drains, streams, and harbor these events also create cleaner and greener communities. For Fiscal Year (FY) 2015, DPW has had 145 stormwater participation events with 4,546 volunteers, 91.4 tons of trash removed and 1,635 trees planted.

The City has made significant capital investments in rehabilitating the sanitary sewer system as a result of its consent decree for the wastewater collection system.

This capital investment, in combination with IDDE (Illicit Discharge Detection and Elimination) including field screening, surveys and tracking, and public education efforts, prevents bacteria loadings.

DPW provided grant support to nonprofits for up to 100% of a project's costs for watershed restoration and rehabilitation projects. DPW provided \$100,000 in 2014 and 2014 and plans to provide \$100,000 in 2016. Details are noted in the FY 2015 MS4 Annual Report.

Grant support was given to the: Growing Green Design Competition: This competition, to reuse vacant land that incorporates community-based stormwater management, used \$100,000 from the City DPW's Stormwater Utility Fund to leverage \$100,000 from the US EPA and \$100,000 from Baltimore City Department of Planning. Green Registry and Stormwater Mapping: DPW granted \$25,000 to the Baltimore Neighborhood Indicators Alliance to improve their existing interactive mapping tool (Green Registry) to support the Green Pattern Book by adding a stormwater element. The mapping tool was developed as part of the Urban Waters Federal Partnership, leveraging other funding from the U.S. Forest Service used for the initial development of the tool. In addition to this direct funding, DPW provided letters of support to non-profits and academic institutions in grant applications that improve water quality in Baltimore City. DPW's support included staff participation in project meetings, providing GIS data, assisting in project review, and helping the various groups access both information and city agencies. In FY 2015, DPW provided letters of support to eleven (11) non-profit organizations and universities for grant proposals. As a result, six (6) grant proposals were successful in receiving a total of \$328,613 from federal, state, and local foundations.

Education and Outreach For FY 2015 Public, DPW conducted: -Five (5) Presentations on the MS4 Watershed Implementation Plan and Stormwater Fee Credit Program (encouraging the public to install stormwater practices) - Thirty-three (33) presentations to 12 schools, 1,068 students with post-presentation testing. School presentations provided information on trash reduction, recycling, rats, and storm drains, related to the health of the harbor. -Eight (8) major festivals and Community events where DPW provided educational materials on environmental topics. In addition, provided education and

outreach at the various community meetings that were held including Mayor's Cabinet in the Community meetings and Public Safety meetings which continue to be held various times throughout the year. DPW Implemented various incentives related to trash reduction

Some of these incentives are: - Baltimore has an e-cycling program. It received an e-cycling grant - \$38,000 in July 2014 - Municipal Can Pilot Program (piloted in July 2014); In 2016 municipal cans are now being distributed to all 210,000 city households that receive collection services from Baltimore City DPW. Distribution will be complete by June 30, 2015. - Extended summer hours instituted at three trash drop-off centers. This now occurs routinely from Memorial Day through Labor Day. -Free Community Shredding Day (May & September 2014 & 2016) - Clean Your Files Day (April 2014 & 2015) the Mechanical Alley Sweeping pilot project. This has now been expanded to all city neighborhoods. - Community Recycling Bin Sales (February 2015, March 2015, May 2015, June 2015). So far for 2016 recycle bin sales have been held in 4 citywide locations throughout the City and at the Mayor's Cleanups in Spring and Fall and at DPW's Big Truck Day. -Sustainability Commission Town Hall (April 2015) Materials/Paint Exchange (April 2014-October 2014/April 2015-June 2015) Household Hazardous Waste Collection (April 2014-October 2014/April 2015-June 2015/ April 2016 – October 2016)

Youth Works: Clean Team (June 2014 - August 2014) – students distributed information on proper trash disposal in the neighborhoods where they were conducting cleaning and greening activities. DPW Youthworks students were also used in 2015 and will be used again in summer 2016. Continue to provide disposal service for the Water Wheel, a public-private project at the Jones Falls outfall to the Inner Harbor. -Storm drain maintenance, preventive inlet cleaning and debris collection. - DPW's Office of Asset Management incentives include a sanitary sewer Root program including education for consumers on keeping fats, oils and grease out of the sanitary system and enforcement of same. - Installed a new type of storm drain inlet screens with filter inserts in five neighborhoods to keep debris out of the storm drains. The screens allow water but not litter to pass through.

## ***Camden County Municipal Utility Authority NJ***



**Camden County Municipal Utilities Authority (CCMUA), Camden NJ**

### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ Organizational Culture**
- ★ Beneficial Biosolids Reuse**
- ★ Community Partnering & Engagement**
- ★ Energy Efficiency**
- ★ Energy Generation & Recovery**
- ★ Watershed Stewardship**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type : Regional Wastewater Utility with One Wastewater Treatment Plant		
Service Area (square miles): 226	Average annual daily flow: 60 MGD	
Population Served: 500,000		
<b>Location</b>		
Street Address:1645 Ferry Avenue		
City: Camden	State: NJ	Zip Code: 08104
<b>Contact Information</b>		
Name: Andrew Kricun	Phone: 856-583-1223	Email: andy@ccmua.org

**NARRATIVE:**

1) The CCMUA has implemented an ISO-14001 environmental management system which defines our agencies goals to be:

- water quality optimization
- odor minimization
- cost efficiency
- community service
- minimization of carbon footprint and maximization of resiliency

In implementing its EMS, the CCMUA's strategy has been to make sure that (1) the company's overarching goals are clearly articulated throughout the agency from top management down to the line workers; (2) specific improvement strategies move up from the line workers and middle managers who know their aspects of the organization's work best, to top management; and (3) make sure that that workers at all levels have the right equipment and resources to meet their goals. CCMUA employees know that their job involves protecting the water quality of Camden County's rivers and streams, and protecting our neighbors from odors. And, that, ultimately, our agency's goals are to do our part to help save the planet and make a positive difference for the communities that we serve.

In addition, the CCMUA is not only committed to doing its part within our service area but we have also served on national boards (NACWA) and committees dedicated to improving the performance of the entire clean water industry, including environmental justice, climate change, environmental management systems and the Utility of the Future initiative. In summary, our organizational culture is based on the principle of using our resources to make a positive difference for the environment, for the people we serve and for the clean water industry.

2) Beneficial Solids Use—Because of the very close proximity (100 yards or so) of the CCMUA's wastewater treatment plant to a residential community, the CCMUA's main biosolids goal has been to optimize biosolids production in order to reduce odor potential. The first step we took was to replace our secondary thickening centrifuges with gravity belt thickeners. We also significantly upgraded our belt filter presses. This reduced the amount of sludge cake that we generated from 220 tons per day at 18% to about 160 tons per day at 25%. As a result, we were capturing the same amount of solids but reducing the number of sludge hauling events by about 30%. Then, we added a sludge drying facility which further reduced the 160 tons per day of sludge cake to 40 tons of dried biosolids. This significantly reduced the odor potential of the plant. Moreover, the dried biosolids are now a Class A byproduct. We send this byproduct to a cement kiln in Maryland which uses the biosolids in lieu of coal, thereby reducing carbon footprint. Finally, we are in the process of constructing a sludge digestion

facility with a combined heat and power system, which will not only further reduce the tonnage generated from the current 40 tons per day down to 20 tons per day but also generate electricity to operate the wastewater treatment plant.

3) Community Service—Because of the very close proximity (100 yards or so) of the CCMUA's wastewater treatment plant to a residential community, odor minimization is a very important, core, priority for our agency. We have added \$50 million in odor control facilities and implemented a zero tolerance policy with respect to leaving doors open, trucks untarped, chemical pumps running, etc. In addition, we have taken several steps to reduce the odor potential from our biosolids. The first step we took was to replace our secondary thickening centrifuges with gravity belt thickeners. We also significantly upgraded our belt filter presses. This reduced the amount of sludge cake that we generated from 220 tons per day at 18% to about 160 tons per day at 25%. As a result, we were capturing the same amount of solids but reducing the number of sludge hauling events by about 30%. Then, we added a sludge drying facility which further reduced the 160 tons per day of sludge cake to 40 tons of dried biosolids. This significantly reduced the odor potential of the plant. Moreover, the dried biosolids are now a Class A byproduct. We send this byproduct to a cement kiln in Maryland which uses the biosolids in lieu of coal, thereby reducing carbon footprint. Finally, we are in the process of constructing a sludge digestion facility with a combined heat and power system, which will not only further reduce the tonnage generated from the current 40 tons per day down to 20 tons per day but also generate electricity to operate the wastewater treatment plant

A measure of the importance of odor minimization to the CCMUA is that the neighborhood leaders have the personal cell phone of the Executive Director so that they can call at any time, 24/7, in the event of odor issues.

Odor minimization is the floor of the CCMUA's community service aspirations, not the ceiling. It represents a core goal to not interfere with the quality of life of our neighbors. However, our main goal is to not only do no harm, but also to make a positive difference for our communities. To that end, we have helped to found the Camden Collaborative Initiative (CCI), a collaboration among the USEPA, NJDEP, CCMUA, Camden City and over 40 environmental and community non-profits, such as the National Park Service, Nature Conservancy and the Trust for Public Land. The CCI has formed six working groups each working on a different environmental challenge faced by Camden City:

1. combined sewage flooding
2. brownfields contamination
3. air emission impact
4. environmental education
5. sustainability and environmental justice
6. recycling and illegal dumping

Thus far, the CCMUA and its partners have constructed over 50 rain gardens and five riverfront parks throughout Camden City, remediated several contaminated sites, worked on reducing air emissions from industries in the proximity of residential communities, developed a sustainability ordinance and a water conservation ordinance, developed an environmental education manual for Camden City schools, implemented a program for green infrastructure maintenance for at-risk youth and developed a robust recycling and illegal dumping prevention program. The goal of the CCMUA is to become an anchor institution in Camden City, using its resources, and its partnerships, to improve the quality of life for Camden's residents.



4) Energy efficiency—The CCMUA has taken several steps to optimize energy efficiency, including:

- infiltration/inflow reduction programs to reduce pumping and treatment requirements
- addition of variable frequency drives in pump motors to reduce energy usage
- at the wastewater treatment plant, optimize primary treatment in order to reduce reliance of the more energy intensive secondary treatment facilities
- upgrade pure oxygen system with more energy efficient vapor pressure swing adsorber facility
- upgrade aerator blades with more energy efficient model
- installation of solar panels that provide 10% of the plant's electricity needs
- installation of sewage to heat facility to capture the latent heat of sewage and use it to heat boilers during colder weather
- in the process of constructing sludge digestion and combined heat and power facilities to convert digester biogas into electricity.

This project should be completed by mid-2018 and should provide 50-60% of the plant's electricity needs

5) Energy generation and recovery—

- Installation of solar panels that provide 10% of the plant's electricity needs
- installation of sewage to heat facility to capture the latent heat of sewage and use it to heat boilers during colder weather
- in the process of constructing sludge digestion and combined heat and power facilities to convert digester biogas into electricity.

This project should be completed by mid-2018 and should provide 50-60% of the plant's electricity needs

6) Watershed stewardship---The CCMUA's primary goal, and reason for being as a clean water utility, is to protect the water quality of Camden County's rivers and streams. Its first project was to eliminate discharges of 52 wastewater treatment plants into the County's interior streams and convey those flows to the CCMUA's regional plant. This resulted in 99% reductions in fecal coliform levels within the interior streams of Camden County within 3 years.

At the regional wastewater treatment plant, permit compliance is the floor of the CCMUA's aspirations, not the ceiling. The goal is to optimize water quality of the plant effluent to the maximal extent practicable. During the past 5 years, the CCMUA's effluent quality has averaged less than 5 ppm of TSS, even though the permit limit is 30 ppm. This has been accomplished through changing the organizational culture and concurrently upgrading each component of the wastewater treatment process.

In addition, the CCMUA has also sought to protect Camden's clean water resources by: developing a water conservation ordinance, planting green infrastructure to reduce stormwater loading to the City's combined sewer system, thereby protecting that stormwater from being contaminated in the combined sewer system. This also reduces the potential of combined sewage overflows to the Delaware River, cleanup of riverfront brownfields, thereby eliminating contaminated runoff into the Delaware River, elimination of eight combined sewer overflow outfalls and installation of netting systems on the remaining 30 combined sewer overflow outfalls to protect the Delaware River from solids during wet weather events

## ORGANIZATIONAL CULTURE

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Implementation of a systems based approach to environmental management via the ISO – 14001 Environmental Management System

### *Performance Measures & Results*

- Establishes an integrated and well-coordinated senior leadership team
- Senior leadership meets regularly to discuss projects and issues and develop new and innovative ideas and solutions
- Provides opportunities to consult with employees in new processes, innovations and designs before building
- Administration, Operations and Maintenance, Engineering and Finance staff are incorporated into the planning and design process of new projects – As an example: representatives from the above listed departments took part in a recent value engineering session for a \$30,000,000 digester/combined heat & power project
- Maintains attention to employee morale including opportunities to celebrate victories for the utility
- The Executive Director holds all staff meetings to discuss the utility’s performance and to celebrate accomplishments. The Executive Director also holds individual department meetings to increase morale
- Number of sessions, number of people and type of workforce development activities conducted (e.g., trainings)
- From January 2014 through present, staff has participated in 227 individual workforce development sessions (some employees have participated in more than one session)
- Number of open positions that internal candidates can qualify for, as a result of employee training and enrichment programs
- From January 2014 through present, internal Candidates have qualified for 14 position openings as a result of employee training and enrichment
- Resource efficiency improvements related to staff utilization
- From January 2014 through present, approximately \$2,375,000 has been saved by utilizing staff instead of outside contractors for repair and replacement projects

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Participation in or certification in National Biosolids Partnership or ISO programs

### Performance Measures & Results:

- Ongoing exploration and evaluation of alternative uses for biosolids
- The CCMUA has recently joined the Mid-Atlantic Biosolids Association and has contracted with Material Matter, Inc. in order to evaluate alternative uses of biosolids.
- Environmental management systems in place
- Dekra has audited and accredited the CCMUA for both the National Biosolids Partnership and the ISO 14001 certifications.
- Adequate staffing (internally or by contract) to support programs
- The CCMUA has contracted with Synagro to operate and maintain its sludge drying facility.
- Procedures to reduce generation of biosolids in treatment systems
- The CCMUA has contracted to have a digester/combined heat and power system designed and built so as to reduce the generation of biosolids by approximately 50%.

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)

Outreach conducted with other stakeholders and other community groups (e.g., regulators, local officials, watershed groups) Community workforce development programs in place Actively promotes community awareness of the value of water and wastewater and stormwater collection and treatment's role in the social, economic, public, and environmental health of the community Involves stakeholders in the decisions that will affect them, understands what it takes to operate as a "good neighbor," and *positions the utility as a critical asset to the community*

### *Performance Measures & Results*

Number and type of specific projects completed and performance improvements (e.g., rain gardens installed, innovative technologies, or other innovative practices adopted) associated with a partnership 45 green infrastructure projects completed through the end of 2015 (and counting) by Camden SMART green infrastructure program provide estimated 61.2 million gallons captured per year. These include

rain gardens, bioswales, cisterns, rain barrels, stormwater and downspout planters, trees, pervious pavement. Technical and institutional control measures to minimize odor releases from the plant have been instituted and noise and air emissions impacts from local industries and trucks have been and continue to be negotiated by CCMUA and its Camden Collaborative Initiative partners.

Number and type of formal recognitions of partnerships by outside groups (e.g., state or national award) and any associated results for the community (e.g., acres of green space added in the community) Camden Collaborative Initiative (CCI) (CCMUA is a founding member) awarded EPA Region 2 2016 Environmental Champion Award; EPA highlighted CCI's sustainability efforts in a YouTube video (<https://youtu.be/vzIjmHhSC3M>); EPA recognized Camden SMART (CCMUA is a founding member) as a Region 2 2015 Environmental Champion; Camden SMART received NJ Future's 2015 Smart Growth Award for its green and gray stormwater infrastructure program; CCMUA receives WAVE award from Association of Environmental Authorities of New Jersey for forward thinking and innovation; Phoenix Park (five-acre CCMUA project assisted by Camden SMART and funding partners) awarded 2015 Environmental Achievement Award by Association of New Jersey Environmental Commissions and Excellence in Water Resources Protection and Planning Award by NJ Section of American Water Resources Association;

Number of ongoing communications network actions/activities

- Web site updated regularly with green infrastructure activity information Regular updating of the Camden Collaborative Initiative Website Regular Meetings with Camden Collaborative Initiative Task Forces
- Type and number of working agreements and collaborative initiatives for growth planning between and across different levels of government
- Camden SMART (Stormwater Management and Resource Training) initiative formed with public, academic, and nonprofit organizations to take stormwater management actions throughout Camden City; Camden Collaborative Initiative (now numbering more than 45 organizational members) include representatives from federal, state, regional, local governments, private and nonprofit organizations working to address Camden City's environmental challenges with active working groups in the areas of environmental education, land and brownfields, waste and recycling, air quality, water quality, and sustainability and environmental justice.

Type and number of changes in operating practices of other partners (e.g., NPS controls by Ag. Producers, food producers, consumers)

CCMUA its CCI partners developed water conservation ordinance and sustainability ordinance adopted by Camden City; CCMUA arranged with city to oversee city contracted water and sewer operators' performance; signage and access restrictions restricting truck traffic in neighborhood have been implemented through CCMUA work with partners; stewardship of some public parks handled by CCMUA and its PowerCorps program job training members

Level of community support for the benefits and costs of becoming a utility of the future today (e.g., annual survey results regarding community support for utility priorities)

Regular participation by community partners in Camden Collaborative Initiative keeps them apprised of CCMUA activities and affords them input to CCMUA's role in the community while it delivers its services.

Community support for the neighborhood parks and waterfront access and odor and truck traffic reduction effort has been expressed repeatedly.

Level of stakeholder involvement in decisions that affect them

CCMUA engages local community organizations as partners in the Camden Collaborative Initiative within and outside of regular working group meetings.

Number of outreach events conducted to publicize and build support for water and water services

Regular support for local cleanup and tree planting activities, and providing hosting facilities for local organizations. With present National Park Service Technical Assistance grant, sponsoring local family fishing day at CCMUA park facilities and promoting community involvement in park and trail improvement planning.

Type and number of collaborations on data collection and assessment

Data sharing for research and analysis of local sewer system and green infrastructure planning with Rutgers Cooperative Extension Water Resources Program, Trust for Public Land, Nature Conservancy, Camden City, academic researchers, consulting contractors.

Amount and effectiveness of public outreach as an integral part of project planning

Regularly updated Web page provides information on CCMUA activities, in particular green infrastructure, green energy, and other sustainability practices. The present National Park Service Technical Assistance grant is facilitating outreach to and soliciting input from the community on connecting them to the trails, parks, and other green infrastructure facilities provided by the CCMUA. Community workforce programs in place PowerCorps Camden is an environmental job training program for at-risk young people 18-26, being trained in trail and park stewardship, as well as general skills such as time management; two 30-person cohorts participate in a year; The summer Green Ambassadors program provides an opportunity for ten high school students to visit a number of environmental agencies and organizations to explore environmental career options, and participate in typical internship tasks.

## **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

*Performance Measures & Results*

KWh reductions in site energy use/intensity – to date or anticipated in the future (e.g., change in energy required per million gallons treated, or change in energy required per hour of pump operation)

Translation of energy use/intensity reductions to greenhouse gas emission reductions – to date and anticipated in the future ☐ Current and anticipated investment (in USD) in energy efficiency projects or activities, and anticipated savings (in USD)

USD value of other re-investments made as a result of the savings from reduced energy costs

Current and anticipated investment (in USD) in energy efficiency projects or activities, and anticipated savings (in USD Solar Panel power purchase agreement saves the CCMUA approximately \$150,000 per year in electricity expenses while reducing dependency on electric grid. A combined heat and power system which will run on biogas and be completed in 2018 will save the Authority approximately \$1,000,000 annually. Sub-metering conducted for critical process units

Sub-metering for critical process units will be installed in 2017 as part of a project which will upgrade the CCMUA's raw sewage pumps

Conduct and or participation in research activities

The CCMUA installed a sewage to heat facility to capture the latent heat of sewage for use in the plant's boiler system. The New Jersey Institute of Technology is evaluating this technology in hopes of finding other applications for the technology.

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Performance Measures & Results:

- Co-generation systems
- In process of constructing a combined heat and power system which will utilize biogas from a digestion facility to produce electricity and heat which will be used for the sludge drying facility
- Co-digestion systems
- In process of constructing a digestion facility.
- Percent of energy use that is renewable
- Currently 10% of plant's electricity need is produced via solar power and upon completion of the digestion/combined heat and power another 50% to 60% will be produced via biogas

- Change in the resilience of critical infrastructure
- Combined heat and power system will be able to handle the critical electric load of the plant and will utilize black start technology to eliminate dependency on the electric grid

## **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Holistic, integrated protection approach to manage significant potential sources of contaminants in the watershed that improves surface water quality and avoids transferring pollutants from one resource to another Systems that add value to the urban landscape with resilient, adaptable, affordable and environmentally sensitive water infrastructure that continues to provide basic services, but also enhanced recreational, aesthetic and environmental value Integration of wastewater services with urban planning entities Stakeholders comment on evaluation of alternatives in triple bottom line analysis, as appropriate Public education on importance of healthy watershed

### *Performance Measures & Results*

Reduction in wet weather impacts (e.g., flooding, CSOs, SSOs, gallons of infiltrated water not reaching collection systems) 45 green infrastructure projects completed through end of 2015 by Camden SMART green infrastructure program provide estimated 61.2 million gallons captured per year;

Elimination of 8 CSO outfalls and installation and upgrade of CSO netting systems remaining 30 CCMUA and Camden City CSOs reduce amount of solids entering Cooper and Delaware Rivers.

Enhanced pollution mitigation (e.g., sediment capture through green stormwater infrastructure)

Preparation of bid specifications for Camden City sewer maintenance specifying conformance with proper maintenance operations; Increased hydrologic stability (e.g., reduction in flood-prone land area)

Separation of combined sewers in vicinity of Von Nieda Park in Camden City's Cramer Hill section conducted in conjunction with Baldwin's Run stream daylighting project and Von Nieda Park reconfiguration project reduced neighborhood flooding by 50 million gallons per year

Creation or enhancements to wetland areas for natural treatment/storage Enhancement of wetland areas in Cramer Hill section of city of Camden in conjunction with Baldwin's Run stream daylighting project, both components addressing neighborhood flooding problem; Restoring riparian buffer at newly created CCMUA-owned Phoenix Park in city of Camden;

Creation of bioswales and rain gardens throughout city of Camden Type and number of standardized approaches across regions and tools to support regional solutions

Conducted studies of Newton Creek water quality problems and extended it to watershed management recommendations; Policy implementation is beginning; A similar process is beginning with the Cooper River Watershed Results of planning and projects between transportation and other public utilities for ratepayer savings Coordination of green infrastructure improvements in Von Neida Park section of Cramer Hill in Camden City with separation of storm/sanitary sewerage and road improvements Public education on importance of healthy watershed Distribution of "Wonders of Watersheds" insert (prepared by Center for Aquatic Sciences at Adventure Aquarium) with quarterly bill mailing to all Camden County sewer customers;

CCI collaboratively produced Environmental Education Resource Guide for distribution to Camden City schools Engagement of regional environmental partner organizations with regional (including watershed-level) perspective Consultation relationships on various watershed-impacted projects with Delaware Riverkeeper Network, Cooper River Watershed Association, South Jersey Land and Water Trust, New Jersey Conservation Foundation, Trust for Public Land, and The Nature Conservancy Wastewater services integrated with urban Development projects are coordinated with CCMUA as planning wastewater and wetlands requirements are satisfied;

CCMUA participated in development of EPA's CREAT tool for climate impact resiliency assessment (featured in EPA YouTube video [https://youtu.be/\\_w9OmQ3ZMQg](https://youtu.be/_w9OmQ3ZMQg)) Green infrastructure in maintenance policies For numerous green infrastructure installations throughout the city, CCMUA and its PowerCorps trainees are being trained in and implementing appropriate maintenance measures Green infrastructure enhancing recreational, aesthetic and environmental value In Camden City, CCMUA operates a public fishing pier, two parks, and a nature preserve, and is in the process of purchasing a sizeable property about to become a showplace park (Gateway Park)



## Charlotte Water NC



### Charlotte Water NC

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency

Utility Description (combine all plants if a multi-site system)		
Type: 5 Wastewater Plants (123MGD), 3 Water Plants (242 MGD), 90,000 WT of biosolids produced, 4200miles each water and sewer lines, 77 lift stations, 70 Significant Industrial Users, approximately 6000 permitted Food Service Establishments. Charlotte Water is an Enterprise Fund Department of the City of Charlotte.		
Service Area (square miles): 530	Average annual daily flow (MGD): 80.5	
Population Served: 1,000,000		
Location		
Street Address: 4222 Westmont Drive		
Charlotte, NC	Zip Code: 28217	
Contact Information		
Name: Barry Gullet	Phone: 704-336-4962	Email: bgullet@charlottenc.gov

**NARRATIVE:** Charlotte Water (CLTWater) provides drinking water and sanitary sewer services to nearly a million people in the Charlotte, N.C. region. Charlotte Water is a city department with strong interlocal agreements linking Charlotte, six other towns 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 contract operation of five wastewater treatment plants for adjacent Union County. Our organizational culture promotes the principles of Effective Utility Management throughout our operations.

J.D. Power recently announced that Charlotte Water ranked 5th in the South Region in their 2016 Water Utility Residential Customer Satisfaction Study. Charlotte Water was the recipient of the 2015 Sustainable Utility Management Award from the Association of Metropolitan Water Agencies (AMWA). Charlotte Water's overall organizational culture is a culture 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 environment by collecting and treating wastewater, reusing residuals beneficially, and regulating system discharges.

Charlotte Water'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 Responsibility- Focus on Continuous Improvement-** An early managed competition leader, we transitioned into continuous improvement through benchmarking, re-engineering, and embracing quality programs. With a Continuous Improvement Officer on our Executive Leadership Team, we hold corporate environmental ISO 14001, NELAP/ISO 17025, and a quality ISO 9001 certification, as well as participate in Partnership for Safe Water Phase 3. These programs have helped to engage employees from the grass roots level. In addition, we have strong active stakeholder partnerships in our community and regionally.

**Environmental Stewardship-** Charlotte Water's commitment to the environment is focused on meeting the needs of our immediate community and region. This includes participation and collaboration on regulatory policy, water management, and resource planning.

**Financial Management-** Charlotte Water has maintained the highest credit rating with Moody's Investor Service, Standard and Poor's, and Fitch Ratings. The AAA and Aaa ratings are the highest available, and reflect the department's strong operation, management and financial planning.

In order for Charlotte Water to be truly successful now and in the future, we believe supporting and developing our employees is critical. Charlotte Water employs 822 people performing a wide range of operational and support services. Our "HECK" Guiding Principles (Honesty, Effort and Energy, Caring and Knowledge) are laying the groundwork for a new level of internal and external transparency and are clearly communicating expectations for employees to work by.

Charlotte Water is creating a culture that enhances our focus on customers, the environment and public health. Charlotte Water provides opportunities for employees at every level of the organization to engage in department initiatives, programs, projects and teams. Employees contribute to the development of the business plan as part of its annual development and help identify needs for the following year. Charlotte Water encourages collaboration and believes that employees across the department working on projects together provides for both knowledge sharing and innovation. Examples include implementation of new operational practices for procurement, emergency response procedures, recognition programs and leadership training programs.

Charlotte Water supports and encourages employee involvement in the community, in professional organizations and in pursuing educational goals that enhance their personal and professional growth. Charlotte Water employees hold many leadership roles in professional organizations both locally, statewide and nationally. These leaders advocate for sound regulatory policies, implementing strong certification and training programs, and overall support of the water industry and environment.

Charlotte Water believes that collaboration with our community and region is important to the health of our environment and promotes innovative solutions for the future. We have maintained a strong relationship with local universities such as University of North Carolina Charlotte to engage both faculty and students in operations and research. This partnership provides the opportunity for students to learn about our industry and to allow us the ability to complete studies and research that can lead to improvements in our operation.

Charlotte Water depends on hydropower reservoirs controlled by Duke Energy for water supply. The Catawba-Wateree Water Management Group (CWWMG) is a 501(c)(3) corporation consisting of 18 public water supply utilities across two states along with Duke Energy. Its purpose is to identify, fund, and manage projects that help extend and enhance the capacity of the Catawba-Wateree River to meet human water needs while maintaining the ecological health of the waterway. Charlotte Water was instrumental in forming this group in 2007 and provides leadership to the group. The CWWMG incorporated climate change as a factor in its recent Basin Wide Water Supply Master Plan which recommends actions to extend the capacity of the regional water supply from mid-century to beyond the year 2100.

Charlotte Water supports economic development and our industrial community through a balanced industrial pretreatment program of regulation and customer service. Annually we reward industrial customers who demonstrate consistent compliance. In FY2016, 40 local companies were honored with Environmental Excellence Awards. This 19-year on-going recognition initiative builds positive relationships with our significant industrial users and incentivizes compliance.

Through our five year Community Investment Plan (CIP) we identify and prioritize capital infrastructure needs essential to protecting public health and the environment. The five year plan balances projects that support community growth and maintenance of existing infrastructure while ensuring regulatory

compliance and fiscal responsibility. Projects are identified through a year-round effort to engage the community, discuss plans with local towns, collaborate with other City and County departments, and implement long range planning efforts.

Projects in the CIP are categorized to help the public and elected officials understand how the project supports the community's needs:

- Rehabilitation and Replacement- ensures that existing infrastructure is maintained and continues to provide reliable service.
- Regulatory Requirements- ensures compliance with state and federal regulations for water and wastewater.
- Capacity for Growth - provides for long term system capacity to support growth.
- Commitment to Public Projects and Utility Operations- allows for collaboration

Charlotte Water seeks and incorporates opportunities for energy efficiency in our operations. Electricity costs in this region are relatively low compared to some other parts of the country which, if judged solely by cost, can make the business case for energy efficiency improvements difficult. Nonetheless, Charlotte Water recognizes the strong nexus between water and energy and the environmental footprint of providing services. For many years, Charlotte Water staff members have focused on energy management as a cost reduction item by reducing power demands, utilizing off-peak rates where possible, and replacing equipment with more energy efficient models when available. More recently, Charlotte Water is undertaking more proactive measures to not only improve efficiency but to reduce the environmental impacts of the power used. Some examples of current initiatives include:

- Installation of synchronous pump motors at intakes and high service pumps with a 91.5% wire to water efficiency. Future projects will complete this upgrade effort.
- Operational optimization through the use of instrumentation and process control. Operations staff received the WEF Gascoigne Wastewater Treatment Plant Operational Improvement Medal at WEFTEC 2015.
- Reliability and rehabilitation improvements at our wastewater treatment plants that include replacement of high energy equipment with more efficient equipment and processes. One treatment plant project currently under design is expected to result in GHG emission reductions of up to 21% in addition to significant energy savings.
- Excess digester gas from the 64 MGD McAlpine Creek Wastewater Plant will be used in a CHP system to produce 15%- 20% of the electrical energy needed at the plant. The engine and generator installation will be completed in January 2017.
- Charlotte Water has undertaken immediate changes to our vehicles, engines, fuel consumption and driving patterns to reduce emissions. The Billing Cycle Realignment that occurred in May 2015 has already led to an average 16% reduction in meter reading route distance per cycle.
- Charlotte Water participated in a study conceived to explore biodiesel production from grease interceptor waste. Although the project was not successful it demonstrates Charlotte Water's commitment to research and innovation for sustainability.

Charlotte Water organizational culture is a collaborative culture of strong leadership that empowers its workforce to excel and grow. Charlotte Water is a utility moving successfully into the future.

## ORGANIZATIONAL CULTURE

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

EUM-based continual improvement program in place

Established Senior Leadership Team actively engaged in continuous improvement initiatives such as ISO 14001, 9001 and NELAP/ISO 17025

Utilizes the guiding principles of Honesty, Effort and Energy, Care and Knowledge as a foundation for how to plan, perform and evaluate the work that is done.

Innovative partnership with UNCC developed an acoustic technology called Sewer Line Rapid Assessment Tool that determines impairment of sewer lines without going through the costly and time consuming inspection process utilizing more common technologies.

Leveraging vacancies as opportunities for employee growth using temporary promotions, allowing employees to "sample" jobs outside of their traditional work.

Merging operations and support groups to enhance overall performance and employee learning

Providing instruction and coaching to employees around how to apply for promotions, prepare a resume, interview, and other skills need to advance their career.

Holding facilitated Leadership Team retreats periodically to strengthen relationships, reset priorities and focus efforts

Employees participate as mentors and mentees in City-led mentoring program (Shared Leadership Learning program) designed to develop leadership skills and offer exposure to different perspectives and issues.

### *Performance Measures & Results*

- Meet all requirements of the Safe Drinking Water Act and Clean Water Act - Target 100% compliance - Result 99.9%. Recipient of NACWA Platinum, Gold and Silver Awards for compliance. Controlled and managed clean-up of a substantial illegal discharge of PCBs into the sanitary sewer system with no permit violations.

- Promote employee and leadership development- Job shadowing program, Performance appraisal training for all supervisors (8, 4 week, one day session for over 120 supervisors), monthly lunch and learn meetings for technical knowledge sharing, recognition program developed for and by employees (included lunches for years of service and supervisory special recognitions for good work).
- Formed "green team" employee team to evaluate and propose internal sustainability measures - Held internal "conferences" where we brought in external trainers for technical training to maintain certifications and professional development hours which provided 1600 person- hours of training last year.
- Charlotte Water supports an Operations Challenge Team that has competed nationally for the past few years.
- Charlotte Water encourages employees to utilize educational reimbursement to further develop skills and knowledge. Through that program a number of employees have earned degrees ranging from high school GEDs to PhDs.
- Maintain stability in financial management by maintaining fund balance ratio of 50% of operating fund budget, debt-to-PAYGO capital funding mix of 60-40 and debt coverage ratio of at least 2.0 - Met target. Revised the rate setting methodology to enhance revenue stability and sustainability - Documented rate and fee setting methodology into an easy to use guidebook. Completed annual review and refinement of rolling 10 year model that considers customer growth, changes in operations, capital needs, and consumption. Maintain AAA bond rating for all three credit rating services. Gained approval of water/sewer rate increases consistent with long-term financial planning.
- Encourage Wellness – 3 Weekly organized employee exercise programs, wellness rooms at various locations with workout equipment, department sponsored teams for various activities such as softball and Water for People SK. Participate in City-wide wellness incentives to improve employee health and control health care costs. All utility owned property is now tobacco free. Encourage employees to utilize City-provided "MyHealth Clinics" for no-cost health coaching/health care/prescription drugs.
- Reduce Risk Management Exposure - Developed Community Investment Program that was supported by master planning studies in both water and wastewater. Rehabilitation and upgrade needs are tracked, planned, and implemented with collaboration between operations and engineering staff. A critical assets team identifies and routinely monitors/inspects infrastructure considered "critical" based on vulnerability and consequences of failure. ISO 14001 and 9000 certifications were successful externally audited with zero non-conformances. Achieved Phase 3 Level of Partnership for Safe Water in the Water Treatment Plants. The ISO program includes a preventative action committee that develops programs centered on the sustainable SMs of Manpower, Machinery, Material, Measurement, and Method. Storm water pollution prevention is one of the key focus areas of the preventative action committee.

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program

- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Biosolids Master Plan Phase 1 completed with triple bottom line evaluation of technologies of the future.

Biosolids Master Plan Phase 2 underway to identify local or national markets of Class A and Class B products and perform a triple bottom line evaluation and risk assessment of employing the necessary technology.

Biosolids program is ISO 14001 certified.

#### *Performance Measures & Results*

- Nitrogen substitution Approximately 300,000 lbs
- Provide Biosolids to North and South Carolina Farmers - Provide approximately 60,000 wet tons of biosolids to over 3,000 acres per year
- Phosphorous substitution - Approximately 180,000 lbs

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
  - Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
  - Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
  - Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
  - Web presence established with social media engagement
- Lead and support the non-profit corporation Catawba-Wateree Water Management Group which is made up of 18 water utilities and Duke Energy.
  - Actively promote community awareness of the value of water and wastewater and treatment's role in the social, economic, and environmental health of the community through participation in festivals, career fairs, and community activities
  - A Council/Committee appointed Charlotte Water Advisory Committee reviews service extension policies and capital plans and advises City Council as needed.
  - Providing land on plant sites for bike and walking trails as part of a County-wide greenway plan and to provide neighborhood recreation opportunities.
  - Utilize customer satisfaction surveys to identify areas of excellence and areas that need improvement

- Recognize industrial customers who demonstrate consistent compliance with discharge and reporting requirements through the Environmental Excellence Awards and a recognition luncheon. The industries are also published in the newspaper in an advertisement each year. There are 70 Significant Industrial Users
- Provide a drinking water station at major festivals and events in and around Charlotte so that attendees can get fresh free water
- Engage in partnerships with 7 nearby jurisdictions to assist in planning, implementing, operating, financing and advising on capital investments
- Participate on General Assembly established Catawba River Basin Advisory Commission made up of appointed stakeholders from both NC and SC General Assemblies
- Participate in the Catawba-Wateree Drought Management Advisory Group, a two-state organization of water utilities, NGOs, regulatory representatives, and industry who steward the region through drought management procedures
- Provide learning opportunities for youth by offering summer internships through the Mayor's Youth Employment Program
- Partnership with County staff for sampling and testing streams and lakes
- Publishing drinking water quality test results in interactive format on public facing web site to enhance customer trust and improve transparency
- Operate the "Blue Planet" which is a professionally designed and constructed customer education center located at one of our water plants. The Blue Planet is a hands-on science museum type center focusing on the entire water cycle and water/sewer utility operations.

*Performance Measures & Results*

- Manage extensive Industrial Pretreatment program that engages Industrial partners and encourages economic development Partnered with industry to utilize high strength waste as a carbon source for treatment reducing chemical need and related carbon footprint. Recognize industries annually for exceptional compliance. This past year 40 of the 70 industries were recognized. Hold quarterly industrial user group meetings to provide updates to industries on regulatory issues. Our plants have been recognized annually with Silver, Gold and Platinum Peak Performance Awards from NACWA
- Active in professional organizations that promote the water industry and advocacy CWWMG- Chair and founding member, NC AWWA-WEA- Chair Elect, and trustee members, active participation and management of operator training schools and active committee participation. AWWA - committee participation, WEF - current Board of Trustees member, committee participation, Operations Challenge Team. NC Water Quality Association - Board member, participation in discussions with state and regional regulators on various regulations, NC League of Municipalities, Water Resources Research Institute, Water Research Foundation, Water Environment Research Foundation, AMWA, NACWA, NC Urban Water Consortium
- Implement a Regional Wastewater Facility in the Long Creek Basin
- Environmental Assessment completed, Completed comprehensive public stakeholder process, MOU with Mt. Holly and Belmont for service by the regional facility and transfer of nutrient



allocations to the regional facility. Permit application has been submitted. Interlocal agreements with the towns are in final negotiation.

- Stakeholder engagement - demonstration for energy conservation, Community wide partnerships, Partnered with Envision Charlotte to provide aggregate water consumption for 22 buildings in the central business district through the use of advanced metering infrastructure. Participate as a member of City Wide work teams - Environmental Cabinet and internal sustainable practices 'committee. . Partnership with the University of North Carolina at Charlotte for over 15 years. In the past three years, 23 college and high school interns (through Mayors Youth Employment Program) have been hired and given key projects to work on, such as fuel analysis, productivity studies, water quality projects, biosolids projects and process mapping, which help ensure the sustainability of Charlotte Water
- Maintain rain gardens at the McDowell WWTP - 23 Rain Gardens established and maintained on the plant site to manage Stormwater on-site. Best Management Practices as identified through a public stakeholder process involving the town of Huntersville

## **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
  - Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
  - 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
  - Energy management-related training provided to plant staff
  - Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)
- Energy efficiency evaluated for all equipment purchases and capital projects
  - Conduct and participate in research activities
  - Utilization of energy conserving equipment wherever possible
  - Relocation and realignment of operation centers decreased miles driven by 344,849 from FY2013 to FY2014.
  - Billing cycle realignment led to an average 16% reduction in meter reading route distance per cycle.
  - A combined heat and power engine generator set is being installed at the largest resource recovery facility. The
  - CHP system is designed to produce 15% to 20% of the electrical energy needed at the plant.

### *Performance Measures & Results*

- Improvements and upgrades to treatment plants that result in more reliability and energy efficiency: \$20 Million Improvement to the Sugar Creek WWTP (20 MGD) that will provide more energy efficient equipment (i.e. high efficiency blowers, hydraulic improvements, and improved chemical feed systems with corresponding instrumentation to optimize process control). These improvements are expected to reduce GHG by up to 21%. \$40 Million

improvement project for Irwin Creek WWTP (15MGD) currently under construction. Improvements to aeration system to improve energy efficiency and reduce GHG, replacement of major basins to improve hydraulics and reduce pumping needs, Improvements to process control through monitoring and improved instrumentation. Future \$65 Million McAlpine WWTP (64 MGD) Aeration and Final Clarifier project improvements that are expected to provide significant energy savings potentially upwards of 10%

- Partner with Duke Energy to identify power savings alternatives: Participate in "PowerShare" program to voluntarily utilize generators in lieu of power during extreme high demand power events as requested by Duke. This program has saved Charlotte Water over \$500,000/year. Participated in Duke Energy Incentive Program for small energy efficiency programs. Submitted over 20 different projects and received rebate savings.
- Conduct and participate in energy research activities: Partnership with University of North Carolina at Charlotte to complete research for optimization of treatment plants and engage students as interns. Participated in the City wide Energy Efficiency Block Grant program which provided both fellows and interns to identify internal energy efficiency projects. Employee R&D group to coordinate research and pilot projects including piloting of equipment such as high speed turbo blowers, instrumentation for monitoring process control, and dewatering equipment
- Use of Alternative fuels and technologies: Replacement of aging diesel engines in several pieces of heavy equipment to reduce nitrogen oxide (NOx) emissions by 7.93 tons over the life of the equipment. Deployment of hybrid or electric highway vehicles and Installation of an electric vehicle charging station at one Charlotte Water facility and use of smaller electric vehicles for transportation on plant sites in lieu of pickup trucks has led to an estimated savings of 600-900 gallons of fuel per electric vehicle per year over a conventionally fueled vehicle. Participating on a City-wide team evaluating use of alternative fuels.
- Establishment of performance metrics for power consumption and energy use: Individual energy efficiency goals have been set at each of the ISO 14001 wastewater treatment plants. These goals will be audited in January 2017. Performance metrics are tracked quarterly in a dashboard on the Charlotte Water intranet as a part continuous improvement. Data that has been tracked for the past several years includes: chemical cost per million gallons of water treated, kWh per million gallons of water treated.

## City of Cedar Rapids IA



### City of Cedar Rapids IA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Regional System includes resource reclamation, water production, storm water, watershed impact – City of Cedar Rapids, Iowa		
Service Area (square miles): ~ 75 sq mi	Average annual daily flow (MGD): 48-50 MGD	
Population Served: ~180,000		
Location		
Street Address: 101 First Street SE		
City: Cedar Rapids	State: Iowa	Zip Code: 52403
Contact Information		
Name: Mike Kuntz	Phone: 319-286-5282	Email: mikek2@cedar-rapids.org

**NARRATIVE:** The City of Cedar Rapids focuses on problem solving, continuous improvement and finding new ways to improve services to our community. There are a number of Initiatives and programs supported by our Mayor, Council, City Manager and Director team that continue to push our City and Utilities to embrace the Ideals of Utility of the Future (UTOF).

Cedar Rapids has begun “Pursuit of Sustainability”. This journey has been occurring for a number of years, and is one that will continue as a way of doing City business for many future decades. Recent activities: hired a Sustainability Coordinator for the purpose of consolidating efforts that have been under way for many years in areas of energy use efficiency, vehicles Idling reduction, solid waste reduction, promotion of public green space parks, increase participation in public transportation, low impact development policy, promotion and adopting re-use and recycling, use of electronic record keeping, continual efficient production of clean drinking water and reclaiming energy from waste water treatment.

Cedar Rapids Water Pollution Control Facilities has been operating an Anaerobic Treatment process for over 15 years. Approximately 2.5 MGD of Industrial waste streams are converted to Bio-gas for use in our Sewage Sludge Incinerator each day. Our goal and mission is to maximize the use of Bio-gas produced and find waste streams that could be utilized to increase our production of Bio-gas. Future plans include possible fuel cell development, gas turbine to produce electricity and possibly supply gas directly to the market via pipeline.

Cedar Rapids Community Services Center has been leading efforts in Sustainable infrastructure policy in the area of storm water control. Recent activities involve policy implantation for use of permeable pavers, rain gardens, detention basins focused on detention, infiltration and water quality. Other practices; rain barrels, converting parking areas to permeable paving and adding organic matter to soils in lawns and public green spaces to improve soil infiltration. City of Cedar Rapids has funded 50 % cost share programs for citizens and businesses to install practices described, and incentivizing this investment by lowering the annual fees for storm water utility charges for those who participate.

Cedar Rapids Utility Group has been awarded a grant from USDA through Regional Conservation Partnership Program (RCPP) address water quantity and nutrient pollution in the Cedar River Watershed, upstream from source water wells. The City is leading a project team called Middle Cedar Partnership Project (MCP) consisting of 16 partners including agriculture, municipalities, county government, regulatory bodies, and private land owners; all of whom are committed and working toward installing practices on the landscape to improve water quality and reduce water quantity to the Cedar River. (Please see attached informational bulletin for more information) This project has just finished first year of 5 year commitment plans to resubmit application to expand and extend the partnership to the future.

Cedar Rapids Utility believes watersheds belong to all people living, working within, downstream and collectively working toward real water quality improvements by sharing resources is the path to success in improving water quality.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

*Performance Measures & Results*

- Iowa Work Force Development
- Summer School programs for gifted HS kids
- Director and Manager teams working with Patrick Lencioni - improve team function

**COMMUNITY PARTNERING AND ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

*Performance Measures & Results*

<i>Indian Creek WMA</i>	Signed 28E agreement – regular meeting agendas available
<i>Middle Cedar River WMA</i>	
Envision CR Program	
RCPP / Middle Cedar Partnership Program – grant awarded to Cedar Rapids	Year 1 just complete of 5 year Grant from USDA / NRCS

## **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

We have installed 100 sub meters on equipment at our wastewater plant to monitor energy use. We are in the process of installing sub meters on equipment at 2 Water plants this summer.

### *Performance Measures & Results*

- Percent reduction in kWh/MG pumped WW: 13.7% since 2008
- Percent reduction in kWh/lb BOD removed: 26.4 % since 2008

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

\*Plan to evaluate feasibility of solar at water booster pump stations.

### *Performance Measures & Results*

- Anaerobic conversion of Soluble BOD to gas is used in our Incinerator: Part of the Master planning Study will evaluate Fuel cells and electricity generation from Biogas
- Biogas use in Incinerator currently: 48% of gas used is Biogas
- Solar panels installed on our public Transportation garage: Soon we will be selling power to Alliant Energy.

## **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.

- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Emphasis placed on Sustainability – Sanitary Sewer and Storm Sewer Master Plans focused on storm water infiltration, reduction of I&I.

Green Storm Water control practices emphasized (example – top soil rule – disturbed land must replace or add topsoil and organic matter to enhance soil absorption of storm water and provide good base for plants).

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Middle Cedar Partnership Program</i>	Cedar rapids is the lead partner in 5 year contract thru RCPP to promote, fund and install Nutrient reduction strategies and infrastructure on landscape in the Middle Cedar River watershed.
<i>Middle Cedar Watershed Management Authority</i>	Brand new WMA focused upstream of Cedar Rapids 16 partners signed; 4-5 others considering joining
Indian Creek Watershed Management Authority	Partnership with neighboring cities and county on a local stream (~ 8 years) management plan built and recently approved by all members
SSOs – very low # for City our size	< 5 SSOs / 100 miles of sanitary sewer

## City of Fayetteville AR



### City of Fayetteville AK

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Beneficial Biosolids Reuse

Utility Description (combine all plants if a multi-site system)		
Type: Multiple plants		
Service Area (square miles): 46	Average annual daily flow (MGD): 22.6	
Population Served: 92,000		
Location		
Street Address: 1400 North Fox Hunter Road		
City: Fayetteville	State: AR	Zip Code: 72701
Contact Information		
Name: Duyen Tran	Phone: (479) 530-6034	Email: duyen.tran@ch2m.com

**NARRATIVE:** Fayetteville is a trailblazer in citywide sustainability and conservation initiatives. As Arkansas’ only community to receive recognition as a 3-STAR Community, Fayetteville was also the first city in Arkansas to establish a Property Assessed Clean Energy (PACE) Improvement District in 2015. Sustainability efforts are a major differentiator for Fayetteville when focusing on attracting millennials to its unique lifestyle quality and for its targeted business sectors. Organizing and capitalizing on its



sustainable environment is a cornerstone in Fayetteville's future because of its history of aggressive support for sustainability initiatives. Wastewater treatment operations and maintenance have been one of many of the City's major objectives for enhancing sustainability in service to citizens and area businesses.

As the third largest and fastest growing city in Arkansas, home to the University of Arkansas and situated in the foothills of the Ozark Mountains, vibrant Fayetteville takes great pride in its environment and the host of outdoor activities that enhance the quality of life in the community. Effective growth-management separates Fayetteville from other communities. Even with rapid population growth, development and neighborhood gentrification, Fayetteville continues to hold a high standard for the quality of a sustainable, healthy, interconnected City. The City of Fayetteville's Utility Department operates with a focus on continuous improvement and innovative natural resources management. The City's commitment to this important vision is evident in its endeavors to apply technology and progressive thought into everyday services.

The Utility Department has helped advance Fayetteville's objective of enhancing sustainability in services to citizens, as established in the city plan for "Sustainability Goals and Metrics." Sustainable enhancements started almost 10 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 CH2M for wastewater treatment operations and maintenance has been a key conduit for numerous innovations and successes. These range from energy-management and low-water landscaping to wetland and habitat restoration. Fifty CH2M professionals operate Fayetteville's two water-resources recovery facilities and their associated utilities. CH2M also manages the biosolids program discussed in the Beneficial Biosolids Reuse section of this application. Fayetteville and CH2M initiated their partnership in 1987.

Fayetteville's Utility Department manages public assets in four major divisions: Utility Management and Capital Projects, Water and Sewer Operations, Water and Sewer Services, and the CH2M contract operations of two Water Resource Recovery Facilities (WRRF). The department's 76 staff members serve 92,000 residents in Fayetteville and neighboring communities.

The Utility Director oversees the 5-year Water and Sewer Capital Improvement Program of approximately \$26 million, and answers directly to the City's chief of staff and mayor. The Utility Director relies on the City Council to regulate guiding ordinances, resolutions, and funding approval. The Water and Sewer Operations Division operates and maintains the water storage and distribution system, and the wastewater collection system. In addition to operating the WRRFs and biosolids handling system, CH2M operates and maintains lift stations in the collection system and administers the industrial pretreatment program (IPP). IPP administrators collaborate with businesses to curb problematic industrial outflow while promoting an atmosphere conducive to successful business operation. The City of Fayetteville's Utility Department and CH2M staff have teamed up with neighboring cities to develop state legislation that enables nutrient trading as a potential tool to allow much more cost-effective environmental protection in the future.

A closer look at WRRF operations reveals further evidence of the Utility Department’s commitment to progressive management. Upgrades and cost-savings initiatives are ongoing at both plants, including the use of three “peak-shaving” generators that are saving the City hundreds of thousands of dollars per year through a collaborative program with the local electrical utility. The biosolids management program incorporates energy-management and design features that curb costs associated with drying, hauling, marketing and disposal. Also, the wastewater team is leading a critically important phosphorous and sediment removal program at a City-owned lake that is part of the White River watershed.

Operations staff members make every effort to engage in the community. They give presentations and lead classes for nearby schools and the university. They also engage routinely with regulators and officials from the U.S. Environmental Protection Agency and the Arkansas Water Environment Association. They volunteer for industry related organizations, such as serving on the boards of the U.S. EPA Regional Industrial Pretreatment Association, the Arkansas Water and Wastewater Managers Association and the Beaver Watershed Alliance.

In addition to compliant wastewater and biosolids management, the Fayetteville-CH2M partnership, and its unique level of trust and mutual benefit, have resulted in low-cost utility service—a contributing factor to Fayetteville’s recognition among 2016 most affordable cities by US News & World Report. Fayetteville is the only city in the original US News Top 10 best places to live to make this new list. The Utility Department’s engaged management and operating philosophy embrace challenge and positive change. Adopting new tools and methods, and working to assure they yield maximum benefit, have positioned the department for a successful future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Public-private partnerships for key utility operations yield efficiencies and innovative approaches that might not otherwise have been identified or implemented. Active involvement in community and planning activities promotes engagement with citizens, civic groups, educators and local/regional leaders. Achievements and awards for operations excellence, safety and environmental stewardship support and validate efforts toward performance and citizen service.

### *Performance Measures & Results*

- Resource efficiency Utility energy management systems; renewable energy application and natural-resources management successes
- Policies to achieve sustainability and economic growth Low-cost utility services help attract business Innovative waste management mitigates regulatory and compliance burden
- Equitable access to neighborhoods that are healthy, walkable and distinct. Recognition among 2016 most affordable communities by US News and World Report
- Expanded recycling – diversion of 10,000 tons of biosolids from landfill. Refocus of biosolids management and beneficial use; application of solar energy in biosolids drying and processing helps recover costs and reduce emissions/carbon footprint.

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Researched and identified alternative-energy and low-energy use technologies for biosolids drying and processing. Solar dryers use minimal energy to produce Class B biosolids. Thermal dryers bring solids quality to Class A using low-emitting natural gas.

Created a biosolids marketing and distribution program that sells processed biosolids for agricultural use. Program helps offset costs of operating biosolids drying and processing program.

Provide a stable, long-term disposal method for biosolids that produces positive environmental impact.

### *Performance Measures & Results*

- Reduce fuel consumption for biosolids hauling by 30 percent. Dewatered biosolids are hauled to the drying facility instead of the landfills, reducing approximately 245,000 miles per year
- Reduce operating costs, including hauling and landfill fees by 50%. Saved nearly \$500,000 per year in labor, fuel, equipment, and landfill fees.
- Make a net-positive environmental impact. Diverted an average of 97% of biosolids from landfills after the first 2 years of operations. The program has generated and sold more than 10,000 tons of Class A biosolids for beneficial use since the inception.
- Improve net carbon footprint of participating agricultural enterprises. Provided cost effective nutrient source for up to 30% of potential supplemental nutrients required for participating local farmers as an alternative to using oil-dependent commercial fertilizers
- Reduce use of natural gas to obtain Class A biosolids. Utilized solar drying operation to offset potential natural gas requirements by up to 50%

## City of Fond du Lac WI



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### City of Fond du Lac

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency

Utility Description (combine all plants if a multi-site system)		
Type: Fond du Lac Regional Wastewater Treatment Facility		
Service Area (square miles): 80 +	Average annual daily flow (MGD): 7.5	
Population Served: 70,000		
Location		
Street Address: 700 Doty St		
City: Fond du Lac	State: WI	Zip Code: 54935
Contact Information		
Name: Jeremy Cramer	Phone: 920-322-3662	Email: jcramer@fdl.wi.gov

**NARRATIVE:** The Fond du Lac (FDL) Regional Wastewater Treatment Facility, soon to be called “The Fond du Lac Regional Resource Recovery Facility,” is a continuously changing and ever-improving water and resource recovery complex. Fond du Lac is a 7.5 MGD activated sludge facility with temperature phased anaerobic digestion. Raw products like domestic, industrial, and high strength waste enter the facility and finished products such clean water, biogas, electricity, and valuable, nutrient rich soil amendments are produced.

At first glance, the facility appears to be like most other wastewater treatment plants around the world, but a more in depth look will reveal a number of differences. The differences begin with the attitude and willingness of our 19 highly motivated and educated staff to not only accept but also drive change. The staff’s ultimate goal is not to simply meet effluent permit limits but make impactful changes to the local and regional watershed. The attitude at FDL is to do more and do it better than ever before, employing a more complex and thorough understanding of the treatment processes. Challenges are met head-on by a team of professionals that not only look for a better way, but are determined to find a better way.

A significant part of the motivation of the staff stems from the beliefs of the organization. Our management team encourages continued education and training opportunities because we know our organization is responsible for much more than meeting permit effluent limits. Our team realizes that making clean water, biogas, electricity and beneficial reuse products in the most efficient and economical way has shifted the status of the department to a Utility of the Future within our city structure, surrounding community, and nation-wide.

Our staff has worked with local industries, not against them, to help them grow and to help treat their wastes as economically as possible. We are participating in increased efforts outside of our community and helping make a difference in our local watershed with the monitoring of water quality at 17 watershed sampling sites county-wide. Both inside and outside the fence of our facility, our staff is making our environment better. Being progressive and thinking outside the box is evident when you see our team using DNA analysis to optimize facility operating conditions or when you see our lab staff measuring soluble non-reactive phosphorus on a daily basis to better determine if we can meet a future predicated effluent phosphorus limit of 0.04 mg/L.

The FDL team is always looking for ways to improve, innovate, and create a better pathway to water quality. We strive to find solutions to problems and create ways to offset costs and generate revenue, and in the process, shape our future. Our organization is in the early stages of becoming a Utility of the Future, but the strong leadership, attitude, and drive that the staff displays is like that of a mature Utility of the Future, and the changes and projects underway clearly demonstrate that.

The facility is operated with reduced energy consumption and costs to our rate-payers at the forefront of our decision making. Energy conservation is noticeable throughout the facility and operating as efficiently as possible is paramount. The activated sludge process is operated at low dissolved oxygen set points and biological phosphorus removal is encouraged. There is also LED lighting around the entire complex and all equipment is operated at levels that promote the least amount of energy use possible. When purchasing equipment, energy consumption plays an impactful role in the decision making process. Projects have been completed and are currently underway to conserve even more electricity, and at the same time treat and recover more resources than ever before. The most significant energy savings and resource recovery project on the horizon for 2017 includes the installation of a

deammonification process. The deammonification process will help the facility realize energy savings and help play an impactful role in other important ways. It will allow Fond du Lac to conserve carbon to better drive biological phosphorus removal and will also enable us to continue to be a facility that helps local industries by accepting their high strength waste which we then anaerobically digest and produce valuable methane gas. Utilizing bacteria to do work instead of using electricity is always what our facility prefers.

Additionally, there are many other points of interest beyond our organizational culture at the FDL facility that show our commitment as a Utility of the Future. Some highlights include the following:

- In 2015, we joined the Water Equipment and Policy Research Center (WEP). WEP is a collaborative organization consisting of universities, private organizations, and wastewater utilities funding research geared toward the benefit of the water industry.
- 40% of our facility's energy is produced with the use of biogas from our high strength waste.
- We have significantly increased land application of our biosolids and are taking greater interest in managing the program in-house versus through contractual obligations. Our biosolids application to land rate has increased to 70% and reduced our hauling and disposal costs by \$80,000 annually. We have also developed a community outreach program with information materials to hand out to area residents.
- Since 2012, we have piloted seven new and established technologies which would aid in process optimization. Piloted technologies have ranged from a full scale cerium chloride phosphorus removal pilot to a system operated with algae for the removal of phosphorus. Another unique pilot was one that harvest struvite from the digestion process upstream of dewatering.
- New equipment is trialed at our facility quite often. One example is a current trial with a new submersible pump that has a variable frequency drive build into the motor.
- Significant process changes have been made to the operation of our activated sludge process. We have cycled power on an off to our anoxic mixers, lowered dissolved oxygen set points, and have reduced the number of aeration basins in service all in an effort to promote biological phosphorus removal in a facility that was not designed for such. All of the modifications have taken place in a period when facility loadings have increased.

As illustrated, our staff willingly steps outside of their comfort zone and is not afraid to take on new and unknown projects or processes. Going beyond the normal limits and getting the most out of our equipment, processes, and staff are the norm. We not only embrace the concept of taking in new raw products and efficiently and creatively producing several beneficial and valuable end products, but also continuously push further, experimenting with different ideas and methods to extract and reuse everything possible from the wastewater flowing to our facility. A quote from Abraham Lincoln sums up the attitude of our staff, "The best way to predict the future is to create it" and Fond du Lac is doing just that by exemplifying what it means to be a Utility of the Future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Integrated and well-coordinated senior leadership team - Our senior leadership staff which includes positions such as superintendent, industrial pre-treatment/lab coordinator, operations research coordinator, operations leader, and maintenance foreman meet weekly to discuss current and future needs and desires of our organization.

Fully engage staff on collaboration of new processes, innovations, and designs – The first step in any project involves discussion and brainstorming amongst all staff, not just senior level staff. We encourage the active participation of all employees.

Daily operational meetings - Employees are given daily opportunities to share ideas and solutions to more effectively operate the plant and solve facility related issues.

Participation in research with other utilities, universities, and private organizations for advancement of water conservation and resource recovery – Fond du Lac is a member of Water Equipment and Policy Research Center (WEP) which is a research organization that drives innovation in North America’s water industry.

Fully evaluate all infrastructure and capital improvement projects – Our staff carefully selects and evaluates all potential projects based on likely payback and returns on investment to ensure they are not only appropriate for process improvements but also beneficial to our rate-payers and other stakeholders.

#### *Performance Measures & Results*

- Employee participation in continued education opportunities
- Nearly 100 % of employees attend multiple training sessions and conferences annually. Our management staff ensures an adequate budget is reserved and increases funds set aside each year.
- Employee opportunities to share ideas and recommend solutions
- Employees participate in daily meetings to discuss current and future facility plans and operational strategies.

#### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use

- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Ongoing exploration and evaluation of alternative uses for biosolids – Our facility recently completed a Biosolids Management Study to evaluate potential options for biosolids re-use and further treatment using a drying process to obtain a Class A product. Capital improvement money has been budgeted for investment towards the most feasible alternative for our facility plan.

Adequate staffing (internally and by contract) to support programs – In-house, we have a member of our management team who is responsible for biosolids management and works closely with our hauling contractor.

Increase in agricultural land application - Since 2010 our biosolids land application program has increased the use of our biosolids to land for agricultural use and highly discourages landfill disposal.

#### *Performance Measures & Results*

Land application of biosolids - 70% (up from 0% in 2013) are applied to the land for agricultural use.

### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Outreach conducted with other stakeholders – We are actively engaged with local watershed groups, fellow municipalities, and university research groups.

Public education and outreach – We offer learning opportunities to local schools and universities for education and awareness about resource recovery using facility tours and speaking events. .

#### *Performance Measures & Results*

- Promote facility tours - At minimum 500 people tour our facility annually.
- Public outreach - Our staff continually engages in public outreach activities geared towards community education.

### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)



- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Evaluate all equipment purchases and capital projects for energy efficiency – Energy evaluations are conducted for every project or process improvement we look at or are involved in.

Research and modify current processes and equipment to reduce energy usage - Our facility continually makes modifications to operational conditions to promote energy efficiency such as removing an aeration basin from service, lower DO set points, cycling of mixers, etc.

Sub-meter at critical equipment processes – Currently, our aeration train, solids handling, and influent pumping are sub-metered to allow for tracking of energy usage in those areas. Many other pieces of equipment can also be monitored via SCADA for power consumption.

Utilization of energy conserving equipment – Our facility almost exclusively uses variable frequency drives in nearly all equipment and operates a combined heat and power unit for energy savings and peak shaving.

Influent pumping modifications – Higher efficiency pumping (new and rehabbed pumps) and influent wet well level modifications have all been made within the last year.

#### *Performance Measures & Results*

- kWh reductions in site energy use per 1000 lbs BOD removed: 573 kWh / 1000 lbs BOD / year 2012 – 1305 kWh 2015 – 732 kWh
- kWh reductions in site energy use per million gallons: 1088 kWh / MG / year 2012 – 2616 kWh 2015 – 1528 kWh
- Energy efficiency project investments: Investments: \$60,000 LED lighting upgrade – 2016 \$ 4 million (Deammonification) – 2017
- Airflow reduction (SCFM) to aeration basins: 11.5%

## City of Grand Rapids MI



### City of Grand Rapids MI

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Watershed Stewardship

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): The City of Grand Rapids Water Resource Recovery Facility is a single plant serving 11 communities.		
Service Area (square miles): 127	Average annual daily flow (MGD): 42.6	
Population Served: 277,030		
<b>Location</b>		
Street Address: 1300 Market Ave SW		
City: Grand Rapids	State: MI	Zip Code: 49503
<b>Contact Information</b>		
Name: Mike Lunn	Phone: (616) 456-3914	Email: mlunn@grcity.us

**NARRATIVE:** The City of Grand Rapids wasn't always a Utility of the Future. Grand Rapids, part of the struggling "rust belt" region, was suffering from declining general fund revenues from a weak economy after the collapse of the manufacturing industries. However, the employees of the City of Grand Rapids knew that even in a declining economy, success was possible. We knew that we could come together, for the public good, and create an environment that raised everyone's quality of life. The work completed over the last three decades has created an entirely new future for the City, and our culture has played a large role in that success. Our top-to-bottom transformation story is an incredible one, and one driven through the creation of a culture of innovation, collaboration, inclusiveness, continuous evolution, transparency and accountability. Not just buzz words to us, these words define our decision making each and every day to build a sustainable City platform.

Change often is driven through leadership, and that is also true for Grand Rapids. The City of Grand Rapids leadership style focuses heavily on a culture where employees are part of a collaborative team with an unwritten rule that ideas are encouraged and fostered. In recent years, several major projects have ushered in a new era that have secured a positive future for Grand Rapids for many years to come, while introducing our community to ideas that build a sustainable city. Embedding these practices and policies in to our work is what's contributed to our success. Our concept to build a "Sustainable City Future" is written in our Fiscal Plan and is the driving force for many of our projects, a few of which are listed here.

#### Combined Sewer Overflow Project

Like many municipalities, Grand Rapids had a combined sewer system starting in the 1900s. The city had 59 sewer overflow sites and discharged into our most precious resource, the Grand River. In 1969, we were allowing 12.6 billion gallons of raw, untreated sewage to flow into the river. Today, we are proud to say that after 27 years of working to separate the city's storm and sanitary sewer systems, that number is zero. This project cost \$400 million dollars, but was universally recognized for its importance to preserve the quality of our watershed for generations to come - something incredibly important for us in the Great Lakes region. A project of this magnitude crossed multiple departments within the city, and took tremendous buy-in from our tax and rate payers, as well as from our elected leadership.

#### Solar Array Field

Through an innovative public-private partnership, the City of Grand Rapids will complete the installation of a photovoltaic solar farm by the end of 2016. The solar farm will be located directly across the river from the Water Resource Recovery Facility and will send electricity back to the facility. Instead of buying

energy from Consumer's Energy, we'll buy directly through a power purchase agreement to save the city upwards of \$200,000 per year. The site of the solar field will be on an old 120 acre landfill that was operated by the City as an open dump 1950 to 1967 and then as a sanitary landfill until 1973. Working with the EPA, the City of Grand Rapids was able to negotiate the solar array design on this Superfund site.

#### Heat Recovery Project

A heat recovery project uses heat from the Water Resource Recovery Facility's north blower building to heat the north secondary building. This measure is saving us \$25,000 annually in natural gas reduction.

#### LED Lighting Conversion

A self-installed LED lighting conversion throughout the Water Resource Recovery Facility was implemented in 2014. Not only did this save time and money during the installation process, but we continue to see positive results in energy savings.

#### Real-time Controls

With an eye on staying on the forefront of modern technology, the Water Resource Recovery Facility began using new tools like a zero angle photo spectrometer and real-time controls. With these innovative tools, we are able to easily monitor and control processes at the facility quickly and more accurately. The key component enabling the Water Resource Recovery Facility to move forward is the recent installation of a system which performs quality assurance and quality control (QA/QC) on the in site analyzers on a real-time basis.

#### Water Reuse

The Water Resource Recovery Facility uses energy recovery from the facility's final effluent to heat and cool the Environmental Services Department's administration building. The facility also uses final effluent for operations and maintenance around the facility. Combined, these activities recover an estimated 360,000 gallons of water per day. We aim to double that amount by 2021.

#### City-wide Green Infrastructure

The City of Grand Rapids has incorporated green infrastructure throughout the city whenever possible. This has been through the use of bioswales, rain gardens, porous pavement, and infiltration basins. 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. By being a leader in the country in these areas, we have created a city-wide culture among our staff and residents to adopt sustainable skills and practices in their own lives and businesses. For instance, we operate a Basin Buddy Program that encourages residents to adopt a catch basin in their neighborhood to keep them clear of debris. To date, the residents in Grand Rapids have officially adopted 106 catch basins.

#### Water Resource Recovery Facility Renamed

In December of 2015, the Grand Rapids City Commission officially approved the proposal to change the name of the wastewater treatment plant. Now known as the Grand Rapids Water Resource Recovery Facility, the name change is one more reflection of the city's focus on sustainability and energy efficiency. It also highlights the City of Grand Rapids' emphasis on contributing to a cleaner and safer environment. While the facility was constructed in 1931, through innovative leadership and an engaged workforce, the City of Grand Rapids Water Resource Recovery Facility has been able to expand its building and services to not just meet the needs of the city and surrounding communities, but exceed them to truly be a Utility of the Future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Establishes a city-wide mentoring program to strengthen our workforce and organize for the exciting future ahead.

### *Performance Measures & Results*

- Number of training sessions hosted in partnership with MI Water Environmental Association and other organizations: 10
- Number of staff who attended a conference: 25
- Number of educational handouts given to the public last fiscal year: 1200
- Number of staff who attended seminars: 50

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Partnership with adjacent Wyoming Clean Water plant for biosolids management. The two cities formed the Grand Valley Regional Biosolids Authority to manage biosolids.

### *Performance Measures & Results*

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<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Dry Tons Land Applied, Landfilled with Methane Capture</i>	<p><b>Water Resource Recovery Facility (WRRF)</b>  Amount sent to landfill - 11,949.30 (FY2015) / 9,508.64 (actual as of 2/29/16 – FY2016)  Grand Rapids WRRF subtotal – 11,949.30 (FY2015) / 9,508.60 (actual as of 2/29/16)</p> <p><b>Wyoming Clean Water Plant (WCWP)</b>  Amount sent to landfill – 1515.30 (FY2015) / 739.6 (actual as of 2/29/16)  Amount applied to land in bulk – 4,258.70 (FY2015) 4,933.60 (actual as of 2/29/16)  WCWP subtotal – 5,774.00 / ,573.30 (actual as of 2/29/16)</p> <p>Total 17,723.30 / 15,081.90 (actual as of 2/29/16)</p>

<b><i>Dewatering Performance</i></b>	
<i>24 months average</i>	Grand Valley Regional Biosolids Authority (GVRBA) Centrifuge - % of recovery = 96.6% GVRBA Polymer lbs. per dry tons = 20.6 GVRBA Centrifuge Cake % of TS = 25%
<i>12 month average</i>	GVRBA Centrifuge - % of recovery = 97.7% GVRBA Polymer lbs. per dry tons = 20.6 GVRBA Centrifuge Cake % of TS 24.5%

## COMMUNITY PARTNERING & ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Adoption of the Quadruple Bottom Line approach to add an additional pillar, Governance.

Routinely conducts tours of the Water Resource Recovery Facility to the public, including many students.

### *Performance Measures & Results*

- Number of people who attended a tour of the Water Resource Recovery Facility in the last 12 months: 1504
- Number and type of formal recognitions of partnerships by outside groups: 29
- Percentage increase in Facebook “Likes” in last 12 months: 50%
- Presentations given each year to outside organizations and conferences: 12

### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Utilization of energy conserving equipment wherever possible.

Process optimization with real time Controls.

Conduct and participate in research activities.

Sub-metering conducted for critical process units and equipment.

Participation in voluntary energy efficiency programs including Energy Star and Michigan Battle of the Buildings (U.S. Green Buildings Council – West Michigan Chapter) (2014, 2015, 2016).

Waste heat recovery from Blower Building and Final Effluent.

Participates in the DOE Better Building Program

2nd place winner of the U.S. Green Buildings Council ‘Battle of the Buildings’ award by creating energy-efficient practices in our buildings

### *Performance Measures & Results*

- Total Annual WRRF Electrical use ( kW/year):  
2015 – 21,097,600; 2016 (projected) – 20,881,856
- Total Annual WRRF Natural Gas Usage (CCF/year):  
2015 – 205,456; 2016 (2016 projected) – 185,812

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)

- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Currently working to implement anaerobic digestion and CHP by 2019.

PPA for 2.5MW Solar Energy Project on adjacent Superfund site.

Completed replacement of Multistage Blowers with High Efficiency single stage blower resulting in a two million kWh/y reduction.

Completed replacement of all outdoor lighting with LED.

Purchased Green Energy Blocks from supplier.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Future – Percent Gris, Solar Power, Biogas and Green Energy Blocks</i>	Future
<i>Cost Savings by individual project.</i>	<p><b>South Plant Real-time Nitrogen Control</b> -675,000 kWh/y E. coli of UV – 725,000 kWh/y</p> <p><b>North Blower Replacement</b> – 2,000,000 kWh/y</p> <p><b>Lighting Projects</b></p> <p><b>Outdoor Lighting</b> – At the WRRF we replaced a total of 270 outdoor Metal Halide and High Pressure Sodium lighting fixtures with LED fixtures of the same style. The LED fixture cost was \$63,981 and we will be receiving \$10,622 from a Consumers Energy rebate to help offset this cost. We had a \$10,550 installation cost and an estimated \$4,400 annual maintenance savings due to the expected 22 year life of the lamps. With an energy savings of \$10,468 per year, calculated at 9 cents per kW hour at 12 hours on time per day, our expected payback in this investment will be 4.3 years.</p> <p><b>Tunnel Lighting</b> – At the WRRF we replaced a total of 137 indoor compact fluorescent lamps, located in the underground tunnel system, with LED lamps of the same style. The LED lamp cost was \$2,048 and was not eligible for a Consumers Energy rebate. We had a \$1,674 installation cost, which will be more than offset by the annual maintenance savings, estimated at \$1,005/year, due to the expected 3 year life of the lamps. With an energy savings of \$1,782 per year, calculated at 9 cents per kW hour at 24 hours on time per day, our expected payback in this investment will be 1.3 years.</p> <p><b>Sewer Maintenance Garage Lighting</b> – At the Sewer Maintenance Facility garage area we replaced a total of 27 indoor 400 Watt High Pressure Sodium lighting fixtures with 128 Watt Fluorescent fixtures. The fixture cost was \$2,084 and we will be receiving \$1,563 from a Consumers Energy Rebate to help offset this cost. We had an actual \$3,331 installation cost. With an energy savings of \$2,465 per year, calculated at 9 cents per kW hour and 60 hours on time per week, our expected payback in this investment will be 1.6 years.</p>
<i>D.O.E EnPI</i>	Electricity (MMBTU) -215,964



<i>Not Normalized 2015 data</i>	Natural Gas (MMBTU) – 21,100 Total (MMBTU) - 237,064 Electricity (MMBTU) Annual Savings - 14,642 Electricity (MMBTU) Estimated Cost Savings - \$117,770.52 Natural Gas (MMBTU) Annual Savings - \$4,546 Natural Gas (MMBTU) Estimate Cost Savings- \$33,875.20 Total Production Output (MMBTU) – 22,559,671 Production Energy Intensity (MMBTU/Unit) - .011 Total Improvement in Energy Intensity (%) - -0.0658 Annual Improvement in Energy Intensity (%) – 0.0048 Total Savings Since Baseline Years (MMBTU/Yr) – 19,188 New Energy Savings for Current Year (MMBTU/yr) – 19,275 Estimated Annual Cost Savings - \$151,646 Avoided CO2 Emissions – (Metric Ton/Year) - 3886
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## WATERSHED STEWARDSHIP

- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Low impact design is the default approach for street, sidewalk and right-of-way repair, improvement, and reconstruction.

Working towards a Level C of Service for Stormwater Management.

Required storm and sanitary sewer separation project has been completed and all overflow points have been removed.

### *Performance Measures & Results*

- Reduced direct flow to the Grand River for increased resiliency in gallons per year: The City has plans to begin tracking how much water is infiltrated every year
- Increased pollution mitigation: The City will begin measuring areas where the first inch is treated
- Increased porous pavement (square footage): The City has plans to begin tracking how much porous pavement has been installed, with ongoing calculations to be kept up to date
- Tracked Water Quality Index since 1971: Today the average on the sample points along the Grand River above 70 (good)



## ***City of Gresham OR***



**WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY**

### **City of Gresham OR**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

-  **Organizational Culture**
-  **Energy Efficiency**
-  **Energy Generation & Recovery**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type: single Wastewater Treatment Plant (WWTP)		
Service Area (square miles): 31 square miles	Average annual daily flow (MGD): 12 MGD	
Population Served: 114,000		
<b>Location</b>		
Street Address: 20015 NE Sandy Blvd		
City: Gresham	State: OR	Zip Code: 97230
<b>Contact Information</b>		
Name: Jeff Maag	Phone: 503.618.3455	Email: jeff.maag@greshamoregon.gov

**NARRATIVE:** The organization culture at the City of Gresham WWTP has had proactive leadership and organization that results in innovations that benefit ratepayers, as well as the larger world beyond the City of Gresham. An example of this is the seven year effort to make the Gresham WWTP energy net zero. The Gresham WWTP now produces more renewable energy on site than it needs to run the plant each year, the first plant in the Pacific Northwest to be energy net zero, and one of a handful in the U.S. This benefits the ratepayers, but also reduces greenhouse gas emissions and the carbon footprint. There are also many educational benefits - the local 5th graders now have curriculum based upon the Gresham WWTP Journey to Net Zero. The City of Gresham also does a lot of outreach to industry peers who are interested in replicating the success the Gresham WWTP has had with FOG codigestion and cogeneration.

Gresham WWTP has a participatory and collaborative spirit. An example of this is the Energy Committee which includes representatives from engineering, operations and maintenance who meet once a month to focus on continued energy conservation and energy production. This collaboration has resulted in a reduction of power consumption at the plant by 17 percent over the last 5 years as well as the plant being energy net zero since March 2015. Plant staff receive annual energy training, and receive energy awareness reminders in weekly operations and maintenance meetings.

**Energy Efficiency** Since 2010, the Gresham WWTP power consumption has been reduced 17 percent through a combination of operational changes and equipment replacement. In 2010, the plant Energy Management Team was formed and began meeting once a month to focus on energy consumption and the most effective ways to reduce consumption. In 2011, the Process Improvements Project replaced older equipment in need of replacement with more energy efficient new equipment. Equipment replaced included the old digester mixing system (120 HP) with new vertical linear motion “pancake” mixers (10 HP) and 30 year old blowers with modern “air bearing” turbo blowers coupled with modern

air diffusers in the aeration basins. The digester mixing improvements reduced plant energy consumption by 8.5 percent and the aeration improvements yielded a 6.5 percent reduction in plant energy consumption.

Energy Generation and Recovery - With the completion of the Cogen Expansion Project on February 12, 2015, the Gresham WWTP has achieved its seven year old goal of becoming energy net zero. Using the biogas byproduct from anaerobic digesters to fuel cogeneration (cogen) engines the plant now generates more electricity than it uses on an annual basis and has turned the City's biggest energy user into the City's biggest energy producer. The Gresham WWTP is a shining example of the new way of looking at wastewater treatment and blazing a trail to be emulated nation-wide. It's not just about treating waste, it's about recovering resources - in this case generating renewable energy worth over \$500,000 annually.

A key element to this success was the installation of the Fats Oils and Grease (FOG) Station at the Gresham WWTP. Codigestion of FOG (a waste product from restaurant grease traps) with ordinary wastewater sludge in the anaerobic digesters has doubled biogas production, which in turn allowed electrical production to double. With a tip fee of 8 cents per gallon, receiving FOG also brings in approximately \$300,000 annually.

As the Pacific Northwest's first energy net zero WWTP and one of only a handful in the U.S. the Gresham WWTP is getting national and international attention. As such, it is helping to promote the use of this reproducible technology.

The Gresham WWTP has a net metering agreement with the local electrical utility, Portland General Electric (PGE). The net metering agreement with PGE allows the City to put power on the grid during periods of high production or low consumption. The City receives credit for the power put on the grid, which in turn, can be used during periods of low production or high demand. The Gresham WWTP will only rely on grid power when one or both cogen units are down for maintenance. During those times, the plant will not be billed for grid power because the WWTP will be able to use credit for excess power that was previously exported to the grid. The annual net metering cycle restarts every March 1 – at that time, the net meter credit total (for excess power exported to the grid) is reset to zero.

The payback period for the Cogen Expansion Project was calculated to be approximately seven years in several planning documents and grant applications. Now that it is operational, the City will continue to track its payback using actual maintenance cost data, tip fee revenue and electrical savings. Tracking this data helps to point out where cost savings could occur, to reduce payback time.

This project will help the City meet two key goals of its sustainability policy implemented in 2009: the intention to have an 80 percent reduction in City greenhouse gas emissions by 2050, and the intention to use 100 percent renewable energy for City facilities by 2030.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities

- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

#### *Performance Measures & Results*

- Increase daily Fats Oil and Grease (FOG) gallon goal in June 2015 from 10,000 gallons to 12,000 gallons. Required the cooperation of operational staff, FOG vendors and management and good customer service.
- Goal has been met. Tip fee income has increased 20% which will help reduce payback period for FOG Receiving Station. Biogas production has also increased, which results in more consistent electrical and hot water production from cogen engines.
- Obtain professional development hours to keep Oregon professional engineer licenses current
- Goal has been met. Plant engineers attend wastewater conference each year which features a wide range of educational information on the wastewater field. Plant engineers usual present at the conference also.
- Educate public and industry peers on the path to becoming Energy Net Zero
- Goal has been met. Had public Net Zero celebration on Earth Day 2015. Developed specialized curriculum for 5th graders to learn about wastewater treatment plant and the production of renewable energy and becoming net zero. Plant engineers give multiple presentations each year for different conferences in the wastewater, renewable energy, public works, and recycling industries regarding energy conservation and production.

#### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

#### *Performance Measures & Results*

- 12 month running average consumption of no more than 450,000 kwh/month or 5.4 MWh/year – Met goal in 2011, 2012, 2013, 2014 and 2015
- Fiscal year annual average kWh/Million gallons of flow goal of 1308 kWh/Mgal - Met goal in 2010, 2011, 2012, 2013,2014 and 2015
- Replace streetlights and area lights with LED bulbs - Met goal in 2016

- Replace old, existing equipment with 2 new turbo blowers and fine bubble diffusers in lower plant. Also replace digester gas mixing system with linear motion mixers. Completed in 2012. Reduced plant energy consumption by 15%.
- Install sub-meter for lower plant - Sub meter was installed which allows staff to monitor energy consumption of the lower plant and the upper plant. Having more precise consumption info enables plant staff to make better operational decisions with the goal of conserving energy.

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

### *Performance Measures & Results*

- Install solar power plant. 420 mW solar power plant provides 7% of plant power at a discounted rate. No capital cost to the City.
- Install Fats Oil and Grease (FOG) Receiving Station with the goal of doubling biogas production through codigestion so that cogen power production can be increased.
- Project completed, biogas production doubled.
- Install second Cogen Engine to make use of increased biogas production, and make Gresham WWTP energy net zero.
- Project completed. Gresham WWTP has been energy net zero since March 2015. Gresham WWTP produces more energy than it consumes. Plant powered by 100% renewable energy produced on site by solar panels and two 400 kW cogen engines. Projected payback period is 7 years.
- Make use of available energy grants and incentives.
- Approximately \$9.5 million dollars was spent on energy related projects in the past 10 years. 38% of the funding was provided in the form of grants and incentives from the Oregon Department of Energy and the Energy Trust of Oregon.
- Generation of renewable energy credits. REC's are being generated and given to Energy Trust of Oregon in exchange for incentive payment. REC's are registered with the Western Renewable Energy Generation Information System (WREGIS) an independent, renewable energy tracking system for the region.

## ***City of Los Angeles, LA Sanitation CA***



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### **City of Los Angeles, LA Sanitation CA**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**

<b>Utility Description (combine all plants if a multi-site system)</b>		
Type: Regional system; multiple plants; collection system; stormwater		
Service Area (square miles): 600	Average annual daily flow (MGD): 400	
Population Served: 4 Million		
<b>Location</b>		
Street Address: 1149 South Broadway (9 <sup>th</sup> Floor)		
City: Los Angeles	State: CA	Zip Code: 90015
<b>Contact Information</b>		
Name: Adel Hagekhalil, P.E., BCEE	Phone: 213-485-2979	Email: adel.hagekhalil@lacity.org

**NARRATIVE:** The City of Los Angeles, Bureau of Sanitation (LASAN) is recognized as a national leader in providing environmental services that address issues such as air quality, brownfields, climate change and adaptation, renewable fuels, solid resources management, sustainability, water quality, and watershed protection. LASAN has long held the primary responsibility to collect, clean, and recycle solid and liquid waste generated by residential, commercial, and industrial customers in the City and contract cities in the greater Los Angeles region.

We plan and administer the Clean Water Program, the Solid Resources Program, and the Watershed Protection Program. These programs all contribute to and build upon our overarching program of environmental sustainability, which also includes climate change adaptation/resiliency; greenhouse gas emission monitoring, reporting and reduction; green infrastructure and urban greening; renewable energy; and brownfield remediation.

LASAN has over 2,700 employees in its workforce, a large portion of whom will soon be eligible for retirement. To grow our workforce, we employ strategies like career-planning and a mentoring program designed to identify and recruit talented students from local educational institutions. Over the past five years, LASAN has trained our wastewater treatment operators to give them the skills and experience necessary to meet the State’s established requirement for Wastewater Operator certification. LASAN helps part-time maintenance laborers learn trades from the ground up with on-the-job training opportunities, which enables workers who demonstrate high work ethnics and skills to be hired as full-time employees.

LASAN welcomes and recognizes originaive thinking. Last year, LASAN’s “SAN STAR” team received the first City of Los Angeles Mayor’s Civic Innovation Award. The award was for the creation of a clever method for collection truck drivers to map, guide and record their daily routes on a mobile app developed by Environmental Systems Research Institute. The method was tested on field requests from the City’s customer service hotline (311) to clear alleys, pick up bulky items, e-waste, and trash. There are plans to incorporate the method citywide. This updated process will automate route generation for the solid resource collection trucks and eliminate the inefficient manual process of highlighted paper maps for addressing point-to-point and continuous routing solutions. The goal is for drivers to choose more efficient routes while reducing fuel, administrative costs, travel time, and reported problems.

**Clean Water Program**

LASAN is responsible for operating and maintaining one of the world’s largest wastewater collection and treatment systems, proactively maintain over 6,700 miles of sewer lines and 49 pumping plants in addition to four water reclamation plants across the City, which have a combined capacity to treat 580



million gallons per day (mgd) of wastewater. The main purpose of these plants is to remove potential pollutants from LA's sewage in order produce recycled water and to protect our river, marine environments, and public health and have a sustainable city.

An effort to increase local water supply has led the City to recycle nearly 100 million gallons per day of water, for uses such as irrigation, industrial purposes, and groundwater protection. The expansion of the City's Terminal Island Advanced Water Purification Facility is an example of how LASAN continues to focus on ways to help manage our most precious resource-water. When the expansion is complete (this year), the amount of recycled water produced at the plant will double to twelve million gallons/day or 13,440 acre foot per year, which is equivalent to the daily use of potable water by 150,000 households.

**One Water LA Plan:** With a fourth consecutive year of a drought impacting southern California, Angelinos are looking for creative ways to manage water resources. Building off of previous successful planning efforts, LASAN continues to gain momentum on developing innovative projects and policies to capture, conserve and reuse all sources of water in the City through its One Water LA program. This integrated approach looks at water, wastewater, and stormwater in a holistic manner with our partners at Los Angeles Department of Water & Power (LADWP), as well as twelve other city departments and nine regional agencies. With the engagement of over 300 stakeholders representing a wide variety of homeowners, apartment dwellers, businesses, environmental organizations, academia, and other nonprofit organizations, the Vision, Objectives, and Guiding Principles for the program were established. Phase 2 on the plan will consist of technical studies and continuing stakeholder collaboration to identify and compare projects, policies and alternatives.

#### Solids Resource Program

**Zero Waste LA Franchise System:** In 2014, Mayor of Los Angeles established the Zero Waste L.A. Commercial and Multifamily Franchise System, which is scheduled to start summer 2017. The Zero Waste LA Franchise System manages solid resources for the privately-serviced commercial and large multifamily customers in the City, and is designed to achieve a number of environmental goals. These goals include implementing processes to increase the recycling rate to 90% by 2025, introduce clean air collection vehicles and efficient routing to reduce greenhouse gas emissions, and enhance customer service.

**Clean Streets:** The Clean Streets Initiative (CSI) was launched in April 2015 via an Executive Directive issued by Mayor Garcetti. The program adds 5,000 new trash receptacles to the existing 1,000 on city streets, creates a block-by-block cleanliness index to guide and direct resources, and deploys the Clean Streets Strike Team to target persistent areas of trash, illegally dumped bulky items, and debris, which endanger public health and compromise the environment. This effort creates a Clean Streets Corps which is a partnership between the city, Neighborhood Councils, community organizations, businesses, and residents to report locations that need to be cleaned.

**Clean Fuel Vehicle Program:** LASAN continues to advance its Clean Fuel Program to operate one of the largest municipal clean fuel solid resources collection fleets in the country with more than 700 heavy duty collection vehicles in service. The use of these clean fuel vehicles result in a 90% reduction of carbon monoxide and particulate matter and more than 50% nitrogen oxide reduction. LASAN has a goal to convert 100% of our solid resources collection fleet to clean fuel by 2017.

## Watershed Protection Program

The mission of the Watershed Protection Program is to protect the beneficial uses of receiving waters while complying with all flood control and pollution abatement mandates. The program employs a multi-pronged approach to ensure the City of Los Angeles is in compliance with regulations and reduce the amount of pollution flowing into and through regional waterways and the Pacific Ocean. The program manages 1,500 miles of storm drains, 100 miles of open channels, and over 38,000 catch basins. The average runoff flow is about 100 mgd during dry days, but can increase two orders of magnitude during days with rain.

**Low Impact Development:** Los Angeles was one of the first cities in the region to adopt a municipal ordinance in 2012 to ensure implementation of stormwater mitigation measures on private development. Any project that adds creates or replaces more than 500 square feet of impervious area must manage the volume generated from the 85th percentile design storm. Since the adoption of the LID Ordinance in 2012, service at the public counter has increased five and half times and the number of customers served has increased from approximately 300 to 1,600 customers per month. The number of projects approved per month has increased from approximately 50 to 290.

**Enhanced Watershed Management Plans (EWMPs):** In 2015, the City finalized the development of the EWMPs for its four major watersheds in coordination with 30 partner cities, environmental organizations and other stakeholders in the watersheds. Each EWMP is a compliance document with strategies to meet water quality mandates and identifies multi-benefit stormwater capture projects that will improve water quality, promote water conservation, enhance recreational opportunities, manage flood risk, improve local aesthetics, and support public education opportunities.

Under the guidance of Executive Management, LASAN has been a long practitioner (since 2004) to the Ten Attributes of Effectively Managed Utilities and Keys to Management Success. LASAN has developed a culture that is mission driven and outcome oriented. While Executive Management guides the general direction of LASAN, divisions and their employees are empowered to develop and implement their own goals and initiatives. Employee empowerment is further promoted by teamwork at the divisional level and by training and education opportunities for the workforce. Although we provide most of our services as a single source supplier, we create a market culture by benchmarking our achievements against other municipalities and continuously looking for ways to become more efficient and effective.

Our mission, vision, motto and values posted at all Bureau facilities are as follows:

**Mission:** To protect public health and the environment

**Vision:** An organization that sets the benchmark for outstanding service and responds to the challenges of tomorrow.

**Motto:** Quality People + Dedication = Outstanding Services

**Values:** Trust and Integrity, Leadership, Quality Teamwork, Customer Satisfaction and Constant and Never-ending Improvements.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

To develop the strategic planning goals, all Divisions meet with their Strategic Planning Teams (including joint labor and management committees) to identify and prioritize proposals for inclusion in the Utility Strategic Plan. Soon after the completion of the Strategic Planning workshop, the Director starts a round of quarterly communication meetings, at which the goals that have been set for the organization are shared and monitored to ensure success. Annual communication meetings at various locations such as the Joint Labor Budget Retreat in order to share current information, articulate Utility goals, and answer employee questions and concerns are conducted. LASAN conducts monthly meetings to review timely issues and ensure communication throughout the Utility. Each Division Manager attends these monthly meetings and then shares the information with his/her own Division through Division staff meetings. LASAN’s Project Green Leadership (PGL) actively recruits talented engineers at eight local universities, seeking students majoring in civil, chemical, and environmental engineering for full-time and part-time positions. The PGL team represents LASAN at information sessions and career fairs while also conducting on-campus interviews. This recruitment program was established to gather the best and brightest engineers, allowing LASAN to remain in the forefront of protecting public health and the environment.

### *Performance Measures & Results*

- Training Topics Opportunities Provided 582 Total Employee Attendance Count 38,450
- Unique Employees Served 2,896

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Terminal Island Renewable Energy Project (TIRE): TIRE places biosolids in depleted deep subsurface oil and gas formations. The mission of TIRE is to develop a sustainable biosolids management option that is cost-effective, socially acceptable, environmentally sound, and protective of public health and the environment LASAN continuously evaluates new technology and alternatives for biosolids reuse. LASAN

has an extensive Environmental Management System (EMS) through which various biosolids management activities are recorded. Examples of activities tracked using the EMS are: public outreach, communication, monitoring data, standard operating procedures, contingency plans, goals, objectives, website updates, annual reports, and audit results.

#### *Performance Measures & Results*

- Percentage of biosolids beneficially reused 100% of biosolids produced by LASAN are beneficially reused Increase in agricultural land application In 2014 196 thousand tons of biosolids were applied, in 2015 220 thousand tons of biosolids were land applied Increase public outreach The amount of people whom were provided with information on the biosolids program went from 1800 people in 2014 to almost 1900 in 2015 Amount of material diverted from landfill 247 thousand wet tons of biosolids were diverted from landfill Increase in crop production Crop production for Sudan Grass increase by 40% and Milo by 50% from 2014 to 2015

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

The City of Los Angeles, home to four-million people, is developing the One Water LA Plan, an integrated approach for water supply, wastewater treatment, and stormwater management. The planning process brings agencies and stakeholders together to evaluate the whole picture, including challenges and solutions, and to develop the vision and technical plans to address those challenges. Ongoing outreach is conducted with Neighborhood Councils, environmental organizations and various stakeholders to ensure an adequate representation of Los Angeles' diverse communities.

The Los Angeles Environmental Learning Center at Hyperion (ELC) was developed to bring textbook and classroom learning to life through interactive exhibits while showcasing the City's commitment to protecting public health and the environment. As part of the Watershed Protection Program, LASAN has implemented an outreach program to educate residents on the local watersheds, sources of pollutants and ways to reduce it, tips for capturing rainwater and saving potable water, and other information to engage the public in watershed health issues. The program uses social media (Facebook, Twitter and Blogs), quarterly E-newsletters, school visits, and public events. Implementation and Optimization of MyLA311 customer care program. The enhancement includes an online web-based service request system that provides personalized and if-preferred, self-service to our customers and an enhanced mobile app for on-the-go access to request for services.

LASAN works with a wide variety of city departments and outside organizations to protect public health and the environment while maintaining focus on Los Angeles Mayor Garcetti's Back to Basics priority outcomes which include enhancing the quality of City services. For example, a Professional Architect & Landscape Architect Practitioners Assembly served as a forum to bring architects, landscape architects, planners and engineers together to highlight our watersheds' needs, opportunities and constraints, and *to put stormwater into a Low Impact Development (LID) context for working professionals.*

#### *Performance Measures & Results*

- Social Media Activity - Over 13,000 social media followers across Facebook, Twitter, Instagram, YouTube, and Pinterest.
- Educational Facilities - LASAN's Japanese Garden in Van Nuys hosted over 68,000 visitors and 128 group tours. Over 18,000 residents and students toured the Hyperion Water Reclamation Plant and the Los Angeles Environmental Learning Center at Hyperion.
- Community Engagement - Over 7,200 people attended our 6 "Discover Recycling" 2015 Open House events, one of our highest attendances ever! Families played games, danced, took home free fruit trees & mulch, learned about recycling, and sat in our trucks to operate controls.
- Outreach Event Participation - LASAN has visited more than 20 schools; participated in 63 events, and attended over 20 events. Total number of attendees at events: 141, 995.
- Stakeholder Involvement - LA Stormwater quarterly e-newsletter is sent to 10,892 stakeholders. One Water LA Plan was quarterly meetings with over 300 + stakeholders.

#### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

LASAN is currently constructing a cogeneration facility at its Hyperion Treatment Plant to convert digester gas to heat and power.

#### *Performance Measures & Results*

- Reduce carbon footprint - More efficient power generation compared to local utility
- Cost savings in heat and power production - Less expensive electricity compared to power grid
- Renewable energy- Using the digester gas as a fuel in gas turbines
- More reliable electricity, less vulnerable - Hyperion will have availability of both CHP (Combined Heat and Power) and grid power

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

Since 2006, the City's Terminal Island Advanced Water Purification Facility has supplied the Dominguez Gap Barrier with high quality recycled water for barrier protection, which prevents seawater intrusion into the West Coast Groundwater Basin.

LASAN, in partnership with LADWP, have launched the environmental impact review process for the Los Angeles Groundwater Replenishment (GWR) Project. The project proposes to use up to 30,000 acre-feet (more than 9.7 billion gallons) per year of purified recycled water from the Donald C. Tillman Water Reclamation Plant (DCTWRP) to replenish the San Fernando Groundwater Basin.

LASAN has implemented Low Flow Diversions at all major stormdrain outfalls that discharge from the City into Santa Monica Bay. These Low Flow Diversions have not only improved the water quality of the City's dry weather runoff, but it has also helped increase the amount of produced recycled water.

LASAN is in the process of evaluating the impacts of proposed On-site Treatment Facilities (OSTF) and specific requirements. The OSTF policy may consider an operation and maintenance plan, an education and outreach plan, and a new cost assessment evaluation (constituents discharged to sewers may be limited or additional fees may be assessed {i.e. a quality surcharge fee and/or capacity related charge.}).

The City's Hyperion Wastewater Treatment Plant provides treated wastewater effluent to the West Basin Municipal Water District. West Basin has served about 31,861 acf or 28 mgd of recycled water to over 200 customer sites within the service area for landscape irrigation, industrial applications, and seawater intrusion barrier applications.

### *Performance Measures & Results*

- Recycled Water - Recycled nearly 100 MGD of water, used for irrigation, industrial purposes, groundwater protection, recreation enhancement, and wildlife habitat restoration Engineering
- Specifications Modification- In the process of modifying the City's engineering specifications to encourage the use of recycled water in concrete production.
- Expansion of Recycled - Water use in the Los Angeles (LA) Zoo Discussions with the LA Zoo to determine the feasibility of using recycled water for irrigation, wash-down of exhibits, and pool filling at certain qualifying exhibits.
- Expansion of Recycled Water use in the Los Angeles International Airport (LAX) - Discussions with LAX to determine the feasibility of expanding the use of recycled water at LAX for irrigation, cooling towers, and rail washing and rental car washing.

## WATERSHED STEWARDSHIP

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

As of 2014, LASAN has implemented 38,000 catch basin screens and 10,000 catch basin inserts to prevent trash from entering the stormdrain system and receiving waters, to achieve full compliance with trash Total Maximum Daily Load requirements (TMDLs).

LASAN is implementing over 30 regional stormwater capture projects throughout the City after voters in 2004 overwhelmingly approved a \$500 million obligation bond (Proposition O) to fund projects that prevent and remove pollutants from our regional waterways. The vast majorities of these projects uses natural systems for pollutant removal – such as wetlands or other systems – or rely on infiltration of captured runoff and stormwater to benefit local water supply.

LASAN has implemented Low Flow Diversions at all major stormdrain outfalls that discharge from the City into Santa Monica Bay. These Low Flow Diversions divert all dry weather runoff from the stormdrains to the sewer system for treatment at the Hyperion Water Reclamation Plant. This program has significantly improved the water quality at our beaches and Heal the Bay beach grades during dry weather have improved to the highest level (A grade).

Under the City's One Water LA Program, discussions with Los Angeles Unified School District (LAUSD) management to determine potential for off-site stormwater storage and treatment options are taking *place*.

### *Performance Measures & Results*

- Field Test Conducted - 346,691 test for metals, organics, toxicity, and other indicators of treatment systems performance.
- Inspections Conducted - 31,128 inspections of industrial establishments
- Samples Collected - 81,372 samples collected from environment and our treatment plants
- Catch Basin Improvement - 73,366 catch basin cleanings 2,095 tons of debris removed from catch basins

## City of Roseville CA



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### City of Roseville CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Energy Generation & Recovery



Water Reuse

Utility Description (combine all plants if a multi-site system)		
Type: Wastewater utility that manages a regional system with multiple plants.		
Service Area (square miles): 40	Average annual daily flow (MGD): 17	
Population Served: 200,000		
Location		
Street Address: 2005 Hilltop Circle		
City: Roseville	State: CA	Zip Code: 95747
Contact Information		
Name: Todd Jordan	Phone: (916) 746-1829	Email: tjordan@roseville.ca.us



**NARRATIVE:** The City of Roseville’s Environmental Utilities Department provides wastewater services to the city of Roseville and acts as a regional service provider to collect and treat wastewater for approximately 200,000 residents in the western portion of Placer County. The City’s infrastructure assets includes nearly 500 miles of sewer mainlines, 230 miles of sewer laterals, more than 10,000 manholes and two wastewater treatment plants (WWTPs).

Our medium-sized utility provides adequate capacity to service Roseville and surrounding area customers through the Dry Creek (18 mgd) and Pleasant Grove (12 mgd) WWTPs. Both are tertiary plants producing California Title 22 recycled water. Current flows are about 10 and 7 mgd, respectively.

An expansion project is underway at the Pleasant Grove WWTP to meet the demands of a growing region. Expansion of the plant will contribute to the ongoing transition of our wastewater treatment facilities into water resource recovery facilities. This expansion, along with new ideas to use this water resource in new and different ways, will ensure a bright future for Roseville.

The expansion effort will add more efficient treatment process and increase the capacity to treat solids. Improvements will include primary and waste activated sludge digestion, along with co-digestion of fats, oils and grease (FOG) and food waste. This will help meet newly adopted statewide requirements for organic waste, which requires solid waste utilities to recycle organics, and divert food wastes and wastewater sludges from the landfill disposal. With the addition of co-digestion, the Pleasant Grove WWTP expansion brings great opportunity to convert waste into energy.

#### WASTE TO ENERGY SUPPLY CHAIN

As an integrated utility, the city’s Environmental Utility controls both wastewater and solid waste streams laden with organic components that are highly valuable in digester gas production. The city is solidifying this supply chain on two fronts:

1. Create a cooperative approach where the solid waste utilities would collect and process food waste into a slurry – or a semiliquid mixture – and deliver to the WWTP for digestion. We estimate that our WWTPs could process the entire daily load of food waste expected by the nearby regional landfill.
2. Develop a program to collect FOG from restaurant grease interceptors. This could include: A) the use of our collection system crews to service grease traps directly and deliver material to WWTP for digestion or B) create a program where restaurants participate in a bid contract administered by the City. Our solid waste utility is converting its fleet of refuse trucks to compressed natural gas (CNG), which provides an outlet for digester gas. We estimate that the addition of digesters to the Pleasant Grove WWTP will generate enough digester gas to create CNG that can fuel one-half of the refuse truck fleet.

As we look at using digester gas to create CNG, we have opportunities at our Dry Creek facility to upgrade systems to better utilize digester gas. Right now, we use it solely to create compressed air. The scope of the project would include an upgrade of an engine and generator to produce electricity rather than compressed air. The benefit of this conversion are two-fold: it would consume all excess digester gas which will eliminate gas flaring and will offset one of Roseville Electric’s (our local power utility) top five demands, decreasing the need to expand future generation capacity.

#### BOLSTERING THE CITY’S WATER PORTFOLIO

The wastewater utility produces recycled water used for irrigation of parks, golf courses, industrial cooling, and construction water. Currently, up to 20 percent of the treated wastewater is recycled annually. During the past year, Roseville delivered more than one billion gallons of recycled water to its customers.

Currently, storage limits our recycled water use during peak periods. We envision an innovative project that will improve storage and provide an opportunity for groundwater augmentation.

We have learned from the recent four year drought in California that further diversification of our water supply portfolio is essential. Efforts are underway to identify future sustainable water supplies, including new diversion points for more surface water, increase management of our groundwater basins and contemplation of ways to use recycled water beyond just outdoor irrigation.

One of the ways to increase the use of recycled water is through the installation of even more advanced treatment for groundwater augmentation. Because percolation ponds are not an option in this area due to heavy clay soils, an alternative would be direct injection into the underlying aquifer. We know the idea behind injection works in our groundwater basins because we've implemented similar injection storage techniques using potable surface water supplies.

Advanced treatment for groundwater augmentation is typically accomplished by microfiltration followed by a microfiltration/reverse osmosis (MF/RO) process and some form of advanced oxidation. This technology is presently in use and has been accepted by regulatory authorities. The largest problem we face as an inland community with this technology is its inherent need for disposal of brine, which is generated during the RO process. There simply is no good way to dispose of large quantities of brine waste without access to an ocean discharge or deep well injection. An alternative advanced treatment approach is ozonation/biofiltration, which can provide advanced treatment without generating brine waste. Roseville is pursuing pilot studies to compare the efficacy of MF/RO technology side-by-side with ozonation/biofiltration systems and provide performance comparison findings to regulatory agencies for consideration as the program develops.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
  - Established an integrated and well-coordinated senior leadership team.
  - Senior leadership meets weekly to discuss utility goals and milestones

- Team coordinates to achieve common goals (e.g., solid waste organic reduction is incorporated into the wastewater treatment plant expansion by way of digestion feed stock)
- Recycled water division coordinates with water utility to achieve drinking water usage reductions

Provide opportunities to consult with employees in new processes, innovations and designs before building.

- Committee involvement is encouraged and employees use this platform to bring about ideas to promote innovations, such as alternative potable reuse projects for inland communities.
- Maintenance and operations staff is consulted on projects prior to design to leverage knowledge and experience.

Provides opportunities for employees to find and fix inefficiencies, share ideas for solutions to problems.

- Employees have initiated and completed power efficiency studies that lower consumption. A recent simple project was completed in coordination with our electric utility to replace inefficient lighting with LED lights, which lowered power usage significantly.
- Maintenance and operations staff are working together to lower the amount of power used in our secondary aeration process, while maintaining adequate treatment capacity.

Drives an awareness and commitment to workplace safety

- Morning tailgate meetings are held daily prior to the day's work
- Bi-weekly safety updates are given to senior management
- The safety program encourages staff to identify safety issues and provide solutions. Safety awards are given to those that provides safety solutions that are proposed and then implemented.

Maintains attention to employee morale including opportunities to celebrate victories for the utility

- Staff/team achievements for project innovations, completions, or ongoing excellence are recognized and celebrated at quarterly utility manager meetings.
- Monthly newsletters recognize the great work by staff.

Established tracking of progress toward meeting goals and milestones

- Biweekly utility manager meetings are used to track team member progress on projects.
- Management staff meet weekly with the utility manager to provide more detailed progress reports
- Annual performance reporting allow the utility manager to track individual goals and performance of management staff.

### *Performance Measures & Results*

- WEF training conference attendance Engineers, supervisors, and select staff attend up to three WEF events per year, including WEFTEC, WEF Utility Management Conference, WEF Residuals and Biosolids Conference

- Statewide training conference attendance Plant maintenance and operations staff attend CWEA and Tri-State annual conferences.
- Specialized training conference attendance (Maximo, asset management) Staff working directly with Maximo and asset management attend specialized conferences such as the Maximo Utility Working Group and WEF Utility Management Conference
- Involvement with WEF or CWEA committees Engineers and management participate in WEF/CWEA committees, including Collection Systems, Laboratory Practices, Plant Operations and Maintenance, Residuals and Biosolids, Utility Management,
- Water Reuse WateReuse Participation Attend training conferences.

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes

### Cogeneration systems

- Digester gas at the Dry Creek WWTP will be used to generate electricity
- Digester gas at the Pleasant Grove WWTP, enhance by FOG and food waste co-digestion, will be used to generate CNG and electricity with a microturbine

### FOG receiving stations

- FOG receiving stations will be built to support the co-digestion systems

### Heat recovery systems

- Heat will be recovered from the cogeneration systems at each plant to heat the digestion process

### Co-digestion systems

- The City conducted a laboratory food waste co-digestion study with food waste collected from local restaurants and food companies
- Food waste and FOG co-digestion was implemented into the Pleasant Grove WWTP expansion project
- Co-digestion facilities are being added to both treatment plants

## *Performance Measures & Results*

- Reduce non-renewable energy use and carbon footprint
  - Fuel half of the city's refuse truck fleet with CNG
  - Offset up to 50% of the plant's power consumption with a digester gas fueled cogeneration system
- Renewable energy credit generation Both the Dry Creek and Pleasant Grove WWTPs are developing projects that will produce renewable energy credits

- Renewable identification number generation The Pleasant Grove WWTP expansion will include CNG production that will generate fuel for half the City's solids waste fleet, and the RINs to significantly offset project costs.

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
  - Reuse for onsite irrigation and process water (seal water, process sprays, wash water)
  - Reuse off site for power generation cooling system, and irrigation of golf courses, parks, schools, and streetscapes
  - Reuse off site for construction use such as soil compaction and street sweeping
  - Residential reuse program initiated for hand irrigation
  - Communication developed to inform the public of the realities of indirect potable reuse
  - Developing a pilot project to compare treatment capabilities of MF/RO to ozonation/biofiltration
  - Use in-house and external laboratories for testing water quality parameters

### *Performance Measures & Results*

- Wastewater conversion to recycled water 20% of wastewater converted to recycled water
- Gallons of recycled water produced annually Increased to over 1 billion gallons of recycled water served annually
- Conversion projects Converted local park to recycled water irrigation, saving up to 28 millions gallons of drinking water annually
- Reduced dependence on raw water supply Mandated use of recycled water for construction use

## City of San Diego Public Utilities Department CA



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### City of San Diego Public Utilities Department CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Community Partnering & Engagement



Water Reuse

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): City-wide water and wastewater system/regional system		
Service Area (square miles): 450 square miles	Average annual daily flow (MGD): 180 MGD	
Population Served: 1.4 million water customers and 2.5 million wastewater customers		
Location		
Street Address: 9192 Topaz Way, MS 901A		
City: San Diego	State: CA	Zip Code: 91923
Contact Information		
Name: Brent Eidson	Phone: (858) 654-4173	Email: beidson@sandiego.gov

## **NARRATIVE: Workforce Engagement/Empowerment**

In January 2014, a new employee engagement effort was instituted when the City of San Diego Public Utilities Department (PUD) embarked on an aggressive new program to involve employees on a whole new level. The goal was simple, to create and communicate a new brand which would influence employee perceptions, inspire excellence, empower the workforce to embrace positive changes, and create/implement innovative approaches to daily operations.

Starting with the Executive Team, employees were involved on every level as four internal teams were created to spearhead the new branding effort. These teams were 1) Creative Development, 2) Organization Readiness, 3) Brand Champions, and 4) Brand Launch Event.

After two work sessions involving 35 stakeholders, three slogan surveys (internal and external), and 20 presentations made to employees (including our labor union and oversight committee), our brand slogan and new workforce commitments were established.

The 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.

Internal brand Champions provide bi-monthly updates on the employee performance on these four workforce commitments to the management teams on a monthly basis. Then the executive teams from each division report to the PUD director semi-annually.

In addition, employee engagement involving the Director, the Executive Teams, Brand Champions, Human Resources, and each individual employee on every level of the department has yielded new rewards and recognition opportunities such as:

- 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 drawing for gift cards. (The High 5 program has generated a 100% increase in peer-to-peer recognition just in the past year.)
- Catch Me in Action. A special effort to promote recognition. Employees take photos of unique, diverse functions in their division, and Brand Champions select 5-10-photos for collages.
- Certificates of Recognition. Saying thank you for doing a great job.

### **Performance Measures**

In June 2014, all 1,300 employees were invited to the Brand Launching Event. As a result of this new branding effort, employees have engaged in their work in exciting new ways. The Brand delivers Department-wide communication and activities creating employee unity and inclusion. Our internal annual survey indicates that employees feel more valued, recognized, and satisfied with their job as a result.

PUD's 2015 Employee Opinion Survey revealed that 92% of respondents agreed with the following statement, "I provide exceptional customer service to the public". This indicated that employees are highly engaged in their work as a result of the new engagement efforts and the new branding efforts. The Department showed significant improvement in all twelve themes measured by the survey (Communication, Customer Service, Diversity and Inclusion, Divisional Cooperation, Employee Engagement, Integrity, Manageable Workload, Performance Management, Recognition, Safety, Teamwork, and Training).

#### Leadership Development

The Brand initiative spawned a supplemental training program designed to improve our organization's culture: The Growth and Innovation Learning Labs (GILLs), was offered to all senior level staff in the department. Through this leadership development program, employees learn to become proactive leaders through participatory and collaborative group exercises.

The GILLs content includes:

1. Creating a culture of Inclusion. A workplace in which belonging, respect and value enhances performance, morale and productivity.
2. Personal Branding through Credibility and Self-Awareness. Understanding that our personal brand follows us everywhere we go. Employees learn that in order to build our brand, we must build credibility, and this takes self-awareness.
3. Empowerment. Develop a shared definition of empowerment, and awareness of the benefits and importance for empowering our workforce to live-the-brand commitments. Leaders learn the barriers to empowerment, and practice results oriented empowering actions for leaders at all levels.
4. Habits. Supporting a culture of positive habits that result in employees feeling pride. Leaders learn how and why habits form, and how to change routines into more positive habits to feel reward of pride and accomplishment.
5. Creating a Positive Atmosphere. Physical and emotional implications at work. Leaders learn how to transform the workplace into a positive, supportive environment by exploring the effect of atmosphere the individual- both physical elements and emotional state- and how contagious this energy can be. They leave with a set of workable actions to take in order to create a more positive physical and emotional atmosphere.

Initially offered to senior staff, GILLs was so successful that the PUD is now offering these sessions to all employees in FY2017.

#### Community Partnering & Engagement

The City of San Diego PUD employs ongoing community outreach and engagement to ensure that its customers are accurately informed about their water supply. Since 2010, the PUD has invested in extensive community outreach efforts 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 consists of free guided tours of the PUD's 1-MGD Demonstration Advanced Water Purification Facility, speakers bureau presentations to community planning groups and organizations, a youth



outreach program, informational booths at local community events and more. The PUD developed the Pure Water Working group in 2014 to provide a forum for gaining input and feedback from stakeholders who represent its customers and broad community interests. Partnerships have also been formed with the University of San Diego and Think Blue and San Diego Coast-keeper to engage youth of all ages about the Pure Water program. The Pure Water San Diego Program has received a number of awards for its community outreach efforts from the WaterReuse Association, American Water Works Association and the California Association of Sanitation Agencies, just to name a few.

The PUD also has incorporated community outreach efforts to inform the public about water conservation and wastewater services.

### Water Reuse

Planning and implementation is underway currently for a cutting-edge potable reuse program, the Pure Water San Diego Program. The Pure Water Program will maximize water reuse and ultimately provide one-third of San Diego's drinking water by 2035, which equates to 83 MGD of water for human consumption. Phase one of the program will involve the construction of a 30 MGD Advanced Water Purification (AWP) Facility across from the North City Water Reclamation Plant. Construction will begin in 2019 and the facility will be in operation by 2021. One or two additional AWP facilities will be constructed in other areas of San Diego and will produce an additional 53 MGD of water by 2035.

The City of San Diego's existing water system only recycles 8% of the wastewater leaving homes and businesses. The rest is treated and discharged to the ocean. With the implementation of Pure Water, the City's water reuse will increase to approximately seven times what it is today. Once Pure Water is fully implemented in 2035, approximately 56% of the City's wastewater will be recycled. Pure Water decreases ocean discharges by approximately 100 MGD by maximizing the amount of water that is reused. This is around a 50% reduction in future ocean discharges based on current flow projections.

### **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Internal brand champions provide bi-monthly updates on the employee performance on the following workforce commitments: quality, value, reliability and customer service. The executive teams from each division report to the City's Public Utilities Department director semi-annually. A training program called

the Growth and Innovation Learning Labs (GILLs) was designed to improve organizational culture and is offered to all senior level staff the Public Utilities Department. Through the leadership program, employees learn to become proactive leaders through participatory and collaborative group exercises. High 5 Recognition Program allows employees to nominate a co-worker for doing a great job at work. Along with the recognition, the employee nominated is entered into a drawing for gift cards. Catch Me in Action program promotes recognition by asking employees to take photos of unique, diverse functions in their division to be selected and included in department collages.

#### *Performance Measures & Results*

- 2015 Employee Opinion Survey 92% of respondents agreed with the following statement, “I provide exceptional customer service to the public”. The Department also showed significant improvement in all 12 themes measured by the survey (Communication, Customer Service, Diversity and Inclusion, Divisional Cooperation, Employee Engagement, Integrity, Manageable Workload, Performance Management, Recognition, Safety, Teamwork, and Training).
- Growth and Innovation Learning Labs (GILLs) The program was initially provided to all senior level staff in the Public Utilities Department, but was so successful that it will be expanded to all employees in fiscal year 2017.
- High 5 Recognition Program The implementation of this program has generated a 100% increase in peer-to-peer recognition in the past year.
- Branding Presentations Twenty presentations were made to employees to gain input to create and communicate a new brand for the Public Utilities Department.
- Brand Launching Event In June 2014, all 1,300 employees attended the Brand Launching Event, which resulted with employees engaging in their work in new exciting and innovative ways.

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement
- Youth Program implemented to engage youth of all ages, through catered tours of the Pure Water Facility, a Girl Scout Patch Program, Media Days for high school journalism students, and Project SWELL partnership with Think Blue and San Diego Coastkeeper to develop 5th grade curriculum that teaches kids about water and includes an interactive activity about the water purification process used by the Pure Water San Diego program. The City values youth

engagement because it educates future ratepayers and water customers at an early age about their water supply system and the importance of investments in infrastructure.

- Speakers bureau developed to provide presentations to community planning groups and organizations about the Pure Water Program.
- Informational booths at local community events throughout the City of San Diego to provide information on water conservation, wastewater and the Pure Water Program.

#### *Performance Measures & Results*

- Pure Water Facility Tours Provided 632 free tours since June 2011 of the demonstration Pure Water Facility, where recycled wastewater is cleaned to produce high-quality drinking water, to 9,900 members of the public.
- Speakers Bureau Presentations Provided 396 presentations about the Pure Water San Diego Program since March 2010 to 13,200 people.
- E-Newsletters/E-Updates Developed and distributed 16 e-newsletters and 16 e-updates about the Pure Water San Diego Program since November 2010 to an interested parties list of more than 5,000 contacts.
- University of San Diego Partnership Over the past two years, the Public Utilities Department has partnered with three Communication Studies classes at the University of San Diego (USD) to provide students with the opportunity to learn about San Diego's water supply system and develop materials to effectively engage and educate the public about the Pure Water San Diego potable reuse program. The partnership received USD's 2015 Innovation in Community Engagement award that is given annually to one professor/project.
- Pure Water Working Group In 2014, the Pure Water Working Group was formed to serve as a forum for gaining input from stakeholders including representatives from community planning groups, businesses, city council district offices, non-profit environmental organizations, and community leaders. The Working Group has met nine times since its development and the meetings resulted in the development of a report detailing their key recommendations and observations. The input gained has enabled the City to advance a well-rounded, comprehensive potable reuse implementation plan.

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure

Planning and implementation of a cutting-edge potable reuse program, the Pure Water San Diego Program. The Pure Water Program will maximize water reuse and ultimately provide 1/3 of San Diego's drinking water by 2035, which equates to 83 MGD of water for human consumption. Phase I – North City will provide 30 MGD of potable water by 2021 and is currently in the design phase with construction *beginning in 2019.*

#### *Performance Measures & Results*

Water beneficially reused With the implementation of Pure Water, the City's water reuse will increase to approximately seven times what it is today:

- 2015 approximate water reuse via recycled water production = 8%
- 2021 planned water reuse via recycled and pure water production = 25% (Completion of Phase I - North City)
- 2035 planned water reuse via recycled and pure water production = 56% (Completion of Pure Water)

Note: percentages are based on current flow projections.

#### Local supply

- 85% of the City's water is currently imported. The cost of imported water has tripled in the last 15 years and is expected to continue to rise. When complete, Pure Water will provide 83 MGD or 1/3 of the City's water supply, lessening the dependence on imported water.

#### Enhanced utility and community resiliency to water supply and climate variability

- Resilient: Pure Water helps mitigate the effects of natural disasters, such as earthquakes, by providing a local water source.
- Drought Proof: Pure Water will be available regardless of drought or rain, making it a consistent water source for San Diego.
- Locally Controlled: Because Pure Water is locally produced and controlled, it is not subject to heightened competition for limited water resources.

#### Environmental Benefits

- Pure Water decreases ocean discharges by approximately 100 MGD by maximizing the amount of water that is reused. This is around a 50% reduction in future ocean discharges based on flow current projections.

#### Water quality confirmed

- From 2009-2013, the City conducted a number of studies to determine the feasibility for the full-scale Pure Water Program. This included the construction and operation of the 1-mgd Demonstration Advanced Water Purification Facility.
- The results? Since the 1-mgd Demonstration Advanced Water Purification Facility began operating in June 2011, more than 28,000 water quality tests confirmed the advanced water purification process reliably meets all federal and state drinking water standards. The State Water Board and Division of Drinking Water granted conditional approval of the San Vicente concept in 2012 and 2013.

## City of San Jose Environmental Services Department CA



### City of San Jose Environmental Services Department CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Community Partnering & Engagement
- ★ Energy Generation & Recovery
- ★ Water Reuse

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Single plant serving regional area		
Service Area (square miles): 267 Square miles	Average annual daily flow (MGD): 110 MGD	
Population Served: 1.4 million residents and over 17,000 businesses		
<b>Location</b>		
Street Address: 700 Los Esteros Road		
City: San José	State: CA	Zip Code: 95134
<b>Contact Information</b>		
Name: Jennie Loft	Phone: 408-535-8554	Email: Jennie.Loft@sanjoseca.gov

**NARRATIVE:** San José is the largest city in northern California, the tenth largest in the nation. With 537 employees, City of San José Environmental Services Department (ESD) manages environmental utilities and programs including the operation and infrastructure improvements of the San José- Santa Clara Regional Wastewater Facility (RWF).

The largest advanced wastewater treatment facility in California, the RWF is jointly owned by the cities of San José and Santa Clara with ESD serving as the operator and administrator. The RWF serves more than 1.4 million residents and over 17,000 businesses in eight Silicon Valley cities. ESD is rebuilding the 60-year-old RWF by implementing a 10-year, \$1.5 billion Capital Improvement Program (CIP) addressing improvements to the facility.

### Organizational Culture

**San José Environmental Services Department (ESD) leadership engages internal organizational and broader external community priorities.**

ESD strives to meet its mission and vision every day. The ESD Mission is delivering world-class utility services and programs to improve our health, environment and economy and the ESD Vision is a place where people do great work and make a difference.

Monthly, ESD engages and informs the Treatment Plant Advisory Committee (TPAC), an advisory group to the city councils of San José and Santa Clara on RWF policies, operations, and Capital Improvement Program (CIP) milestones. TPAC consists of representatives from the RWF service area. The San José city council approves RWF and CIP policies and budgets.

ESD leadership established a strong foundation of processes and structure for the rebuilding of the RWF. In August 2015, the CIP was recognized for organizational excellence from the California Association of Sanitation Agencies (CASA), for planning the CIP and for prioritizing 120 project packages into 33 distinct projects with budgets and schedules.

ESD leadership is one of five voting members in the Bay Area Clean Water Agencies (BACWA) consortium, a regional group consisting of 38 publically owned treatment facilities that discharge into the San Francisco Bay. ESD leadership sits on seven sub-committees. BACWA works together to have a single regional voice on regional policies and operational best practices.

To develop a future workforce, ESD leadership engages with the Bay Area Water/Wastewater Workforce Development Collaborative (BAYWORK), which focuses on recruitment and training regionally. ESD also collaborates with local community colleges to build future workforce by planning wastewater curriculum, holding career fairs, and developing a certificate program.

**ESD leadership has created a culture of learning, improvement process, and innovative organization.**

ESD leadership establishes a participatory and collaborative culture with RWF operations and maintenance (O&M) and the CIP staff by communicating at quarterly ESD meetings, coffee chats, new managers meeting, and RWF leadership team meetings.

Moreover, they advocate for staff training. For instance, the CIP package and project managers attend monthly project management trainings lead by subject expert consultants. The curriculum follows the Project Management Institute courses.

Key managers and staff are part of the system improvement process. There are three meetings (O&M project debriefing, weekly CIP project package managers meeting, bi-weekly CIP and O&M coordination) for teams to collaborate, debrief, and discuss what worked, what didn't, and identify potential conflicts/duplications to streamline processes and minimize conflicts.

ESD encourages information sharing including brown bag sessions; sample topic: Managing Nutrient Removal at a 4-Sludge BNR Facility.

The CIP Portal, is a central information repository website. The Portal has videos and graphics, allowing for an intuitive navigation and a filter feature to help streamline information. A "Design Guidelines Library" was also created; it's a tool to sustain institutional knowledge. It captures knowledge from senior O&M staff and passes it to new staff.

Another way to share information about the RWF and CIP is through the award-winning ESD quarterly internal newsletter. Two regular columns are by ESD leadership and other articles are submitted by RWF/CIP staff.

**ESD leadership fosters a culture that supports training and builds a leadership bench through trainings and mentoring opportunities.**

ESD provides two department certificate leadership programs with a focus on ESD Mission, Values, and strategic goals. Some courses are taught by ESD Leadership. They are also committed to transferring knowledge from consultants to RWF O&M and CIP staff by June 2017.

ESD offers ongoing training courses available to entry level O&M staff. RWF supervisors also attend City courses including contracts and leadership skills. Finally, RWF O&M staff can attain grade 5 certification for increased technical and leadership skills.

Coaching and mentoring: ESD offers a robust onboarding program including RWF processes and a buddy system. The City also offers a formal mentorship program, which RWF staff participates in as mentors and mentees. Further, RWF O&M staff can "shadow" CIP package and project managers.

ESD leadership believes in growing its own staff. Entry level staff is hired, trained, and promoted to mechanics or operators. On the job training is invested over a four year period.

At the CIP Steering Committee, mid-level managers get to demonstrate leadership skills with ESD leadership and the City assistant manager as they discuss CIP milestone projects in preparation for council items. Some of these include the Cogeneration Facility Design Build project.

Through the human resources department, ESD leadership changed job classifications to increase skills and trade certifications. In addition, ESD offers staff to work in higher classification assignments to build future leaders and take on more responsibilities while on the job.

**ESD leadership supports internal information sharing to understand and meet RWF and CIP key strategies.**

The RWF O&M Staff Engagement Plan and the implementation of the plan allows for a systematic engagement of front line O&M subject matter experts with CIP project managers during CIP project planning, design, construction, commissioning, and start-up. Mistakes were avoided due to this early input and participation from O&M staff.

Community Partnering and Engagement

**ESD is committed to transparency, community engagement, and strong partnerships.**

ESD leadership convenes a quarterly meeting with local environmental nonprofits to discuss environmental-related issues including land use. ESD leadership also attends neighborhood meetings to update and listen from the community. In addition, ESD notifies RWF neighbors of minor issues relating to the RWF, i.e., visible gas flares.

**ESD participated in projects with stakeholders to create community assets.**

ESD leadership actively sought out community voices in the creation of the RWF Plant Master Plan (PMP), adopted by council in November 2013. A protected species, the San José's Western

Burrowing Owl population nests in the buffer lands surrounding the RWF. To prevent further population decline and address concerns from stakeholders, the RWF PMP designated 180 acres of habitat for them.

**ESD leadership supports community educational programs.**

ESD collaborates with the federal government and SF Bay Wildlife Society (SFBWS), a non-profit, to offer an environmental education program. The program provides science education and field trips to 5th through 12th grade from the South Bay. The program is at the Refuge's Environmental Education Center in San José. The Refuge consists of 30,000 acres of open space and restored wetlands into which the RWF discharges treated effluent.

In 2016, ESD launched RWF quarterly public tours for the South Bay community. The one hour tour spotlights wastewater treatment, the CIP improvements currently deployed, and environmental benefits.



## **ESD has established web presence and social media engagement.**

ESD has a robust RWF and CIP web sites highlighting wastewater treatment, CIP, and environmental benefits.

On a regular basis, ESD staff posts a message about clean wastewater, diversity of fish and birds, and the Western Burrowing Owl on ESD's three social media platforms.

The CIP staff publishes a monthly report and semiannual reports on the ESD web page to update the public.

## Energy Efficiency

### **ESD is committed to energy reduction.**

One of the RWF PMP's objectives is to "pursue energy self-sufficiency and reduced greenhouse gas emissions by promoting renewable energy generation, increased energy efficiency, and enclosed biosolids processing."

Two energy management projects are included in the CIP are underway:

- 1) Aeration tanks rehabilitation - Coarse bubble diffusers will be converted to fine bubble diffusers and tanks reconfigured to reduce energy demand
- 2) Blower improvements - Rehabilitating and replacing existing blowers to allow operations staff to utilize them according to aeration demands

Both of these projects will reduce energy demand from aeration.

## Energy Generation

### **Indication of management commitment:**

The RWF PMP defines the energy management goals that the RWF is actively pursuing through the CIP, including achieving energy self-sufficiency by 2022.

### **Internal energy sources evaluated:**

As part of the CIP, the Digester and Thickener Facilities Upgrade project will improve biogas production.

## Water Reuse

### **ESD established a reuse strategy plan.**

The RWF also manages the South Bay Water Recycling (SBWR) program, delivering recycled water to approximately 700 customers in three South Bay cities.

The South Bay Water Recycling Strategic and Master Plan is used as a planning document guiding infrastructure improvements and long range water supply planning.

**ESD invests in reuse infrastructure.**

Investments were identified in the South Bay Water Recycling Strategic and Master Plan over the next five years.

**ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Inclusion of broader community priorities in San José City Council decision making	-9 TPAC members representing San José, Santa Clara, Cupertino, Milpitas, and the West Valley Sanitation District -42 memos sent from TPAC to San José City Council in FY15-16 on key CIP decisions
Award received by RWF for organizational excellence	California Association of Sanitation Agencies (CASA) for <u>Organizational Excellence</u>
Level of participation in Bay Area Clean Water Agencies (BACWA)	7 ESD leaders participate in 7 BACWA committees, including: Executive membership, Permits, Laboratory, Bay Area Pollution Prevention Group, Biosolids, Pretreatment, and Air committees

Number of people attending workforce development activities	<p><b>Career events organized with BAYWORK during FY15-16: Total attendance= 772</b></p> <p>-480 attended the BAYWORK job fair hosted by San José on (330 high school students, 150 job seekers)</p> <p>-100 attended the Career Pathways Summit on May 12, 2016</p> <p>-125 attended a training lunch</p> <p>-67 attended Knowledge Transfer Toolkit Webinar</p> <p><b>San José’s career events during FY15-16: Total attendance = 1,130</b></p> <p>-Over 900 job seekers attended the City of San José career fair</p> <p>-230 elementary school students received presentations about wastewater careers</p>
Number of certificate program	-1 certificate program being developed for Evergreen Valley College
Number of ESD quarterly meetings	6 in FY15-16, 30 attendees on average for each meeting
Number of coffee chats with ESD Directors and staff	2 coffee chats in FY15-16, with approx. 12 staff in attendance for each chat
Number of new managers meetings	1 new managers meeting in FY 15-16, with approx. 11 staff in attendance
Number of RWF leadership team meetings	23 in FY15-16, 6 attendees on average for each meeting
Number of project management trainings lead by subject expert consultants	14 in FY15-16
Number of system improvement process meetings	-1 O&M project debrief meeting in FY15-16 with 12 attendees -50 CIP package meetings in FY15-16, with 13 attendees on average for each meeting

	-20 CIP & O&M coordination meetings in FY15-16, with 20 attendees on average
Number of continual informal learning events for staff	8 brown bag lunches during FY15-16 15 with an average of 15 attendees each meeting
Number of registered users and resources on the CIP Portal	-253 new and existing O&M and CIP staff use the CIP Portal -51 training topics available online on the CIP Portal, most of which have one or more staff designated as resources for employee questions -60 documents available in the “Design Guidelines Library” providing standard guidance and specifications and standard details and written by senior O&M staff for new staff
Award received for the ESD employee newsletter	<u>California Association of Public Information Officials (CAPIO) Award of Distinction for Internal Newsletters</u>
Number of employees enrolled in leadership certificate programs	10 RWF and CIP staff enrolled in “Aspiring Leaders” or “Leading at ESD” programs
Number of staff that attended training courses for entry level positions	38 O&M staff attended entry-level training courses in FY15-16
Number of RWF supervisors who have attended city courses in the last year	53 RWF staff have attended 8 city professional development courses on contracts and procurement process and leadership skills
Number of grade 5 certified operators	11 staff in FY15-16

Number of staff in the buddy system onboarding program	13 new staff in FY15-16
Number of RWF staff involved in the City of San José's mentorship program	15 staff as mentors and mentees in FY15-16
Number of managerial roles shadowed	7 out of 33 (21 percent) managerial roles (package manager, project manager, Construction Manager & Program Controls Manager) have staff who shadow them
Number of staff hired as attendants and promoted to a trade position	2 staff were promoted to trade positions in FY15-16, one to instrumentation and one to maintenance
Number of CIP steering committee meetings	20 meetings in FY15-16, with 9 attendees in each meeting
Number of staff able to temporarily work in a higher classification position	67 staff in FY15-16
Level of O&M staff participation in the RWF O&M Engagement Plan on CIP studies and projects	-25 O&M lead subject matter experts and 106 subject matter experts contributed 168 hours/month in 2015 to 12 CIP Studies and 26 active projects -16% of recorded decisions can be attributed to O&M staff input to Design Teams

**COMMUNITY PARTNERING AND ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

*Performance Measures & Results:*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
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Level of engagement with local NGOs	<p>15 local NGOs participated in 1 meeting in FY15-16</p> <ul style="list-style-type: none"> <li>• Committee for Green Foothills</li> <li>• Save the Bay</li> <li>• Sierra Club, Loma Prieta Chapter</li> <li>• Santa Clara County Creeks Coalition</li> <li>• Santa Clara Valley Audubon Society</li> <li>• Guadalupe River Park Conservancy</li> <li>• Silicon Valley Toxics Coalition</li> <li>• Save our Shores</li> <li>• Citizens Committee to Complete the Refuge</li> <li>• Guadalupe Coyote Resource Conservation</li> <li>• California Native Plant Society, Santa Clara Valley</li> <li>• Our City Forest</li> <li>• Keep Coyote Creek Beautiful</li> <li>• Greenbelt Alliance</li> <li>• Friends of Los Gatos Creek</li> </ul>
Level of neighborhood engagement	<p>7 neighborhood group meetings and community events attended by ESD staff in FY15-16 in Alviso, a neighboring community near the RWF</p> <p>1 meeting with the City's Neighborhoods Commission, which has representations of all neighborhood associations in San Jose including an Alviso representative</p>
Number of emergency notification engagement	<p>3 emergency notifications were sent out in FY15-16 to 10 organizations near the RWF:</p> <ul style="list-style-type: none"> <li>• Silicon Valley Advanced Water Purification Center</li> <li>• Zanker Road Landfill and Materials Processing Facility</li> <li>• Alviso Community</li> <li>• Zero Waste Energy Development Co.</li> <li>• Don Edwards SF Bay Environmental Education Center</li> <li>• Calpine (Los Esteros Rd Critical Energy Center)</li> <li>• SF Bay Bird Observatory, Milpitas Office</li> <li>• SF Bay Bird Observatory, Coyote Creek Field Station</li> <li>• Fire Station 25 (Alviso)</li> <li>• Schlumberger (Baytech Dr.)</li> </ul>
Number of awards received by RWF for the <a href="#">Plant Master Plan</a>	<p>2 awards received in FY15-16:</p> <ul style="list-style-type: none"> <li>• <a href="#">American Planning Association National Planning Achievement Award for Environmental Planning</a></li> <li>• <a href="#">American Planning Association Northern California Chapter Award of Merit for Innovation in Green Community Planning</a></li> </ul>
Number of acres of protected habitat set aside for species of concern	<p>180 acres of habitat for the protection of the Western Burrowing Owl (page 52 of the <a href="#">Plant Master Plan</a>)</p>

Number of students participating in environmental education activities related to wastewater, watershed protection	6,320 students participated in the “Living Wetlands” program in 2015
Number of public tour participants learning about the RWF and CIP	190 in FY15-16, with: <ul style="list-style-type: none"> <li>• 94 percent of participants rating their understanding of the role wastewater treatment facilities as good or excellent after the tour.</li> <li>• 75 percent of participants rating their understanding of CIP as good or excellent after the tour.</li> </ul>
Number of <u>webpage views</u>	21,789 page views in FY15-16
Number of social media posts	35 posts each on <u>Facebook</u> , <u>Twitter</u> , and <u>Instagram</u>
Number of <u>CIP monthly reports</u> to keep the public abreast of project statuses	10 monthly reports in FY15-16

### ENERGY GENERATION & RECOVERY

- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

#### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Demonstrated management commitment to renewable energy use	Commitment on page 19 of the <u>Plant Master Plan</u>
Progress of one renewable energy CIP project: Digester and Thickener Facilities Update project	On May 24, 2016 CIP staff asked the <u>San José City Council</u> to award a construction contract
Anticipated investment in one renewable energy CIP project	\$92.6 million is the anticipated 2016-2020 CIP cost for the Digester and Thickener Facilities Update
Current digester gas production	1,400 thousand cubic feet per day
Project increase in digester gas production once Digester and Thickener Facilities Update project is finished	10 percent over current digester gas production

### WATER REUSE

- Board/executive management reuse strategy established
- Investments in reuse infrastructure

#### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Amount of recycled water produced from wastewater	4.45 billion gallons of drinking water diverted in 2015

Ratio of reuse quantity to wastewater volume processed	10 percent of wastewater volume processed is sent to South Bay Water Recycling
South Bay Water Recycling Strategic Master Plan 5-year projected investments	\$45 million to \$49 million projected investments in reuse infrastructure

## *City of San Luis Obispo Utilities Department CA*



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### **City of San Luis Obispo Utilities Department CA**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**



Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Water treatment plant, wastewater treatment plant, water distribution system, wastewater collection system, and stormwater conveyance system		
Service Area (square miles): 13.2	Average annual daily flow (MGD): 3.1 MGD	
Population Served: 45,802		
Location		
Street Address: 879 Morro Road		
City: San Luis Obispo	State: CA	Zip Code: 93401
Contact Information		
Name: Carrie Mattingly - Utilities Director	Phone: (805) 781-7205	Email: <a href="mailto:cmattingly@slocity.org">cmattingly@slocity.org</a>

**NARRATIVE:** The City of San Luis Obispo, dubbed the Happiest Place in America, prides itself on the strength, compassion, and stewardship of its people. Community members and visitors alike benefit immensely from the forward-thinking leadership of the City, exemplified by the City of San Luis Obispo’s Utilities Department. The Utilities Department is a leader in living out the One Water concept. Without the solid foundation of the City’s organizational culture, the Utilities Department and the community would not be the leaders they are today.

The Utilities Department recognizes how valuable its people are and invests in their futures. Below are just a few examples of not only how the Department upholds the organizational culture exhibited by a Utility of the Future Today, but also leads the way in management excellence.

- **MUD Meetings.** The entire department comes together at least three times a year to host MUD meetings (Meetings of the Utilities Department), which consists of 65 employees, to build morale, encourage team bonding, and provide educational presentations. MUD are entirely planned, organized, and facilitated by Utilities staff.
- **WRRF Intern Program.** The Water Resource Recovery Facility (WRRF) Intern Program provides people with the opportunity to become a wastewater treatment plant operator. The program trains interns to obtain the skills they need to become safe, effective, innovative, and motivated plant operators. The Water Quality Laboratory Intern Program is a similar program that provides opportunities for people to become laboratory analysts. These programs give the operators and lab analysts an opportunity to engage and educate the next generation of staff. Both programs expose interns to the inner workings of the City, allowing them to develop a network of contacts that prove invaluable when they are ready to pursue a career, often at the City itself.
- **Cross-training Program.** The cross-training program supports staff resilience and sustainability by providing water treatment, water distribution, wastewater collection, stormwater system, water quality laboratory, and wastewater treatment staff opportunities to learn what other sections within the department do day-to-day. The voluntary program provides staff with an avenue to make lateral career changes, if desired, and promotes the One Water concept among staff.
- **Skills-Based-Pay Program.** The Utilities Department has pioneered a Skills-Based-Pay (SBP) program, used now in other departments within the City. The SBP program provides financial incentives to those that exhibit leadership skills and show a desire to learn, expand their skillset, and obtain higher

certifications. The SBP program has clearly defined “steps” for each section within the department (ex. water distribution), that provide a pathway to develop effective leaders.

- Utilities Department Strategic Plan. The strategic planning process, in which the entire Department is involved, lays out short-term and long-term goals for the department. As a group, each goal is defined and examined in order to make progress towards meeting the Department’s goals.

In late 2013, the Utilities Department embarked on a journey to upgrade the City’s Water Resource Recovery Facility, fondly known as the WRRF Project. At the outset of the Project, the City developed a Program Charter to capture the vision and culture of the department. The Charter forms a set of guidelines for the WRRF Project team to continue to return to in order to actively engage with the public, transform the WRRF, and provide a sustainable and valuable community asset for San Luis Obispo.

The vision of the WRRF Project is to “create a community asset that is recognized as supporting health, well-being and quality of life”, and the mission is to “deliver a Water Resource Recovery Facility in partnership with stakeholders that provides economic, social and environmental value to our community”. The following Project objectives and performance measures from the Charter embody the Triple Bottom Line objectives of the WRRF Project and the overarching culture of the Utilities Department.

#### Economic Objectives and Performance Measures

- Optimize capital investment and life cycle cost
- Maximize value for ratepayers’ investment
- Incorporate flexibility and scalability to adapt to future conditions
- Simplify process flow and make treatment more robust
- Optimize application of appropriate technology

#### Environmental Objectives and Performance Measures

- Develop and implement a holistic strategy to maximize sustainable resource recovery and manage salts, nutrients and environmental pollutants in the Basin
- Incorporate sustainability practices in planning, design, construction and operation
- Maintain compliance and minimize impacts to operations and the community during construction
- Sustain reliable compliance post-construction

#### Social Objectives and Performance Measures

- Create and sustain diverse partnerships that add value to the community
- Provide an interpretive center and dedicated features to engage and educate the community
- Be a good neighbor
- Engender the trust of project stakeholders
- Support the development and empowerment of City employees

The Program Charter has been a guiding force in every project decision made so far, and encouraged the inclusion of operations, laboratory, and maintenance staff in the project process to foster innovation, ownership, and pride in the project. WRRF staff have attended almost every project meeting, and were integral in the decision to implement a membrane bioreactor (MBR) for the secondary treatment process. The WRRF Project also includes the development of a project website ([slowrrfproject.org](http://slowrrfproject.org)) that is managed by a website committee primarily comprised of City/WRRF staff. As will be discussed in the

following sections and in the Activity Areas in Part 3 of this application, the WRRF Project and many other Utilities programs and projects not only embody the organizational culture of a Utility of the Future Today, but also contribute to Community Partnering and Engagement, Energy Efficiency, Energy Generation and Recovery, Water Reuse, and Watershed Stewardship.

Some specific highlights from the WRRF Project that engage in organizational culture and these other Activity Areas are described below.

- One Campus, One Water concept applied to the Water Resource Center. Currently all sections within the Department are housed in different buildings and different sites. The new Water Resource Center would create One Campus that will house all sections under one roof. A shared building reinforces that everyone contributes to the City's success and that the City manages One Water system that requires everyone to work together.
- Additionally, the Water Resource Center, will also include a Learning Center, demonstration wetlands, inviting public access to engage the community to learn about the City's water resources and see how water is managed through the City's system, from Lake Nacimiento to the San Luis Obispo Creek. It will showcase the City's plan for future potable reuse plans, as well as invite the public to take tours of the upgraded facility to learn more about resource recovery.
- The new Cooling Wetlands at the facility will reduce the need for mechanical effluent cooling and the associated energy consumption, and provide habitat for native flora and fauna. It will also incorporate the existing Bob Jones bike trail, which runs along the eastern side of the site, to provide the public with an interactive wildlife experience.
- The project also positions the City for future potable reuse, either indirect or direct. The decision to pursue potable reuse has influenced the design of the new facility to incorporate flexibility and increase the water quality. This is part of the City's water resource portfolio and the Department has been proactive and planning for this in the future.

Some highlights from other engagements that also fulfill additional Activity Areas include the following:

- Community Partnering and Engagement: The City has had long-standing relationships with Cal Poly, who conducts wastewater research at the WRRF, and Science Discovery, who conducts field trips for elementary school children at the WRRF. Tours for people of all ages are conducted at the WRRF regularly. The Utilities Department Facebook page is also a hub for community engagement.
- Energy Efficiency: Prior to the WRRF Project, the WRRF staff initiated the WRRF Energy Efficiency Project, in partnership with PG&E and AECOM, to identify opportunities to decrease the WRRF's energy consumption through cost-effective energy efficiency upgrades. With support from the City Council and the public, the team successfully implemented the upgrades needed to reduce annual electricity usage at the WRRF by approximately 30%. This represents significant cost savings for the City, considering that the WRRF is the largest power user in the City.
- Water Reuse: Water is currently recycled to a tertiary level at the WRRF and is delivered to recycled water customers in the City. The Recycled Water Production Analysis (completed) and the Recycled Water Facilities Planning Study (in progress) will help the City plan for future water reuse, including potable reuse.

- Watershed Stewardship: The WRRF Project as a whole will result in cleaner effluent being discharged to San Luis Obispo Creek, benefitting the watershed. The Project also includes stormwater management.

The City of San Luis Obispo Utilities Department engages on all levels as a Utility of the Future Today. The many projects, programs, and partnerships underway strengthen the Department and prepare it for the future. Without its leadership, the City would not be as happy a place to live as it is today.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

The cross-training program provides the opportunity for employees within different sections of the department, water treatment/water distribution/wastewater collections/wastewater treatment, to learn more about what the other sections do and encourage partnerships across sections.

The Department provides opportunities to include employees in the decision making process to encourage collaboration and encourage ownership among the staff that is responsible for projects after implementation. A great example of this activity is the inclusion of employees in the planning and design currently underway for the WRRF Project. Employees, such as WRRF operations, laboratory, and maintenance staff, participate in the decision making process by providing feedback during workshops. They are heavily involved in decisions related to design of the upgraded plant.

Drives an awareness and commitment to workplace safety by electing a Safety Officer within each section of the department and participates and the larger City-wide Safety Committee.

Maintains attention to employee morale, including opportunities to celebrate victories for the Utilities Department.

As part of the WRRF Project, a website was developed with staff to promote the project and highlight areas within the project that involve the public and promote the One Water concept. The WRRF Project Website Committee, which will be in charge of developing new content for the website and updating current content, consists of plant staff and interns. Check out the website: [slowrrfproject.org](http://slowrrfproject.org)

The laboratory and wastewater treatment Internship Program has been implemented to help promote knowledge transfer and expand the industry workforce. The Program encourages interns to take

initiative and find opportunities to positively enhance the work environment, by developing special projects, finding ways to eliminate inefficiencies, and providing feedback on the program.

The entire Utilities Department staff is included in the department-wide Strategic Planning process that describes the desired vision for the future of the department.

Conduct Meetings of the Utilities Department (MUD) workshops that include all 65 staff members within the department and consist of team building activities, department announcements, special guests and presentations to encourage unity and collaboration within the entire department. A committee, consisting of 67 staff members, organizes, plans, and sets up the meetings. MUD workshops are integral to valuable team bonding.

The Utilities Department conducts a Skills-Based-Pay program that provides financial incentives to staff for obtaining certifications, exhibiting leadership skills, taking initiative and promoting a healthy workforce environment.

The Utilities Department participates in the citywide Centre for Organization Effectiveness Leadership and Learning Academy. Employees have and continue to participate in Leadership Lab, START (a program for employees who are interested in what it takes to be a supervisor), and Supervisor Academy. DISC and Strengths Finder are key elements to promote employee empowerment and career enhancement.

#### *Performance Measures & Results*

Your Results (quantitative or qualitative) Number of MUD meetings organized and hosted 3

- Number of employees risen from WRRF Internship Program this year 2
- Number of WRRF Project meetings and workshops that included field and lab staff within the last year 45
- Number of City employees that participate in Leadership SLO each year (“Leadership SLO is a county-wide program designed to bring participants out of their “comfort zones.” It’s a rewarding way to learn new things, make friendships that will last a lifetime, explore personal biases, and learn new leadership styles and ways of handling diversity in opinions and people.”) 2
- Level of staff engagement in the Utilities Department strategic planning process High
- Number of employees participating in the WRRF Project Website Committee 8
- Number of SLO Utilities Facebook page posts about employee accomplishments 21
- Number of special projects developed by staff and interns 2
- Number of positions filled internally 7

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)

- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

The WRRF hosts facility tours for students of all ages, community members, and visitors to engage and inform the community and visitors about one water treatment. In the future, these tours will include a stop in the new Learning Center and a stop at the Demonstration Wetlands.

Outreach is conducted with regulators and local officials. In particular, the WRRF Project team has held outreach meetings with the Central Coast Regional Water Quality Control Board and the US Department of Fish and Wildlife, EPA, and more. These meetings engage the regulators and enhance the project by incorporating regulatory components early on in the process.

Utilities actively promotes community awareness of the value of water and wastewater. Public workshops such as the Community Water Forum and the future Learning Center, (will) promote the One Water concept and increase awareness of the value of water supply, treatment, and reuse. The

Department involves stakeholders in the decisions that will affect them, understands what it takes to operate as a “good neighbor”, and positions the utility as a critical asset to the community. Such events as the Water Forum, Thursday Night Farmer’s Market booth, and WRRF Project Community workshops, provide a forum for the community to provide input. One major example of this was the resulting planning for extensive odor control, which stakeholders made clear was highly important to them.

Actively partners with other departments within the City, such as the Parks and Recreation Department and the Public Works Department.

#### *Performance Measures & Results*

- Number of meetings with community stakeholders and environmental education opportunities 31, not including WRRF tours or Project meetings
- Number of Utilities Department Facebook page likes 2,315 total, approximately 180 in the last year
- Number of Resource newsletters published (The Resource is a quarterly newsletter prepared and published by the Utilities Department that focusses on managing community resources for the future: water and wastewater. It is sent to postal customers in the City.) 4
- Average number of WRRF tours given to community members a year 50
- Number of WRRF Project decisions made with the Triple Bottom Line in mind - All decisions made
- Number of public events held to publicize and build support for water and water services 60
- Partnerships developed - Downtown Association, Parks & Rec Department, Park Rangers, Public Works Department and sections, Science Discovery, Regional Water Quality Control Board Cal Poly University

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Began in March 2012, the WRRF Energy Efficiency Project aimed to upgrade aging and inefficient systems to improve energy and operational efficiency and to avoid future capital costs, upgrade / replace the existing cogeneration system to utilize available bio-gas produced onsite and to maximize cost savings, upgrade existing Supervisory Control And Data Acquisition (SCADA) controls to maximize energy and operational efficiency for the entire facility, and procure the maximum available electricity and natural gas utility incentives. The City implemented seven major upgrades:

- 1) Cogeneration System Upgrade,
- 2) Headworks Replacement,
- 3) Solids De-Watering System Upgrades,
- 4) Variable Flow RAS Pumping and Controls Integration,
- 5) Filter Tower Media and Controls Upgrades,
- 6) Exterior Lighting Upgrades, and
- 7) SCADA Systems Upgrade.

### *Performance Measures & Results*

- Approximate cost savings through energy efficiency savings and reduction in operation and maintenance costs (in 2013 dollars) \$325,000/year \$11,087,492 over 25-year equipment life
- Current investment in energy efficiency projects or activities, and anticipated savings \$10 million investment
- Estimated return on investment 14%
- Estimated avoided emissions 1,000,000 lbs of CO<sub>2</sub>
- Estimated percent of the WRRF’s current electrical power demand covered by on-site cogeneration implemented through the WRRF Energy Efficiency Project 25%

## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)

- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

The WRRF Project will increase renewable energy production by including additional cogeneration capabilities and solar energy generation. This will provide the WRRF with additional renewable energy to offset purchased energy from PG&E, reducing reliance on non-renewable energy sources.

The WRRF Project will position the City to implement fats, oils, and grease (FOG) receiving stations in the future, which will provide additional fuel for the biodigesters, therefore increasing the amount of useful biomethane produced.

#### *Performance Measures & Results*

- Estimated percent of total annual future electricity use generated by solar panels (excluding buildings) 7%
- Percent of future plant electricity use generated on-site from renewable resources (current cogeneration and future solar) 18%

#### **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

The 2014 Update to the Recycled Water Master Plan will assist the City in shaping the future for recycled water use within the City service area and beyond, prioritizing both current and future recycled water needs and sets forth a mechanism for addressing those needs.

The Recycled Water Production Analysis conducts a capacity evaluation of the existing recycled water system at the City's WRRF. The evaluation determines current infrastructure production capabilities, and evaluates secondary effluent supply and recycled water demand. It also provides recommendations to assist the City and WRRF staff in optimizing current practices and/or updating infrastructure to maximize recycled water production, prior to the WRRF Project upgrades (currently in the preliminary design phase).

The Recycled Water Facilities Planning Study, currently in process, develops and evaluates recycled water use alternatives, and identifies preferred alternatives with the greatest potential for beneficial use that will help the City meet their goals. The preferred alternatives for increasing recycled water use will be selected and implemented in coordination with the WRRF Project.

The WRRF engages in reuse for on-site irrigation.

The City is positioning itself for the success of a future potable reuse project, either indirect, direct, or both. Such positioning includes the choice of MBR for the secondary/tertiary process upgrade at the WRRF and the development of the Recycled Water Production Analysis and the Recycled Water Facilities Planning Study.



Use of in-house laboratories for testing water quality parameters.

*Performance Measures & Results*

- Percent increase in recycled water deliveries from FY 14-15 to FY 15-16 10.39% increase
- Number of customers served with recycled water 39 metered connections for landscape irrigation, 6 construction water sources
- Impact of the Recycled Water Production Analysis Improvements and the WRRF Project on recycled water production Recycled water production and delivery is expected to increase significantly.
- Planned use of advanced treatment - Pending potable reuse in the form of groundwater recharge and direct potable reuse, advanced treatment will likely be used to create a drought-tolerant source of drinking water for the City.
- Planned UV disinfection system--UV disinfection will be used to treat all water in the WRRF post-upgrades. Chlorine will no longer be used to treat plant effluent. This reduced the potential for THM production and keeps them out of the watershed.
- Public acceptance of reuse commitments for nonpotable opportunities Moderate to High

**WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

The WRRF Project will result in San Luis Obispo Creek water quality improvement through treatment upgrades and an improved effluent water quality.

Systems that add value to the urban landscape with resilient, adaptable, affordable, and environmentally sensitive water infrastructure that continues to provide basic services, but also enhanced recreational, aesthetic and environmental value – the WRRF Project Cooling Wetlands.

*Performance Measures & Results*

- Created or enhanced wetlands and riparian habitats 2 Reduction of wet weather impacts Less flooding anticipated

## City of Tacoma Environmental Services WA



### City of Tacoma Environmental Services WA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency

Utility Description (combine all plants if a multi-site system)		
Type: Multiple plants, collection system and separate stormwater system		
Service Area : 49 square miles	Average annual daily flow: 24 MGD	
Population Served: 210,000		
Location		
Street Address: 2201 Portland Avenue		
City: Tacoma	State: WA	Zip Code: 98421
Contact Information		
Name: Dan Thompson	Phone: 253-502-2191	Email: dthompso@cityoftacoma.org

**NARRATIVE:** Tacoma Environmental Services is committed to its mission of providing sustainable and cost effective management services to protect the environment, recover value from Tacoma’s waste streams, and enhance the quality of life for the citizens and rate payers of Tacoma. We envision ourselves as national leaders that operate fiscally sound utilities, reducing our environmental footprint for the benefit of our community and future generations. Though we exist as three distinct utilities (solid waste, surface water and wastewater), we believe that a synergy is created through cross functional approaches that maximize our ability to be a high performing organization.

Examples of cross functional efforts include collecting food waste from commercial establishments and redirecting them to the water reclamation facility to increase biogas production. The TAGRO biosolids program has a robust marketing plan that not only ensures 100% recycling of all biosolids products but markets products like wood chips and compost produced by the solid waste utility. The surface water utility has altered its standard specifications for construction projects to specify TAGRO soils and soil amendments, increasing awareness and use of biosolids products within the Tacoma city limits.

Tacoma Environmental Services partners with external organizations such as the Pierce Conservation District’s Harvest Pierce County program and the Russell Family Foundation’s Puyallup River Initiative. Harvest Pierce County manages a community gardening program consisting of more than 70 community gardens and a variety of community food projects such as gleaning and cooperative farms. The TAGRO program provides not only monetary support but donates biosolids-amended soils and soil products along with yard debris compost and wood chips free to all community gardens and cooperative farms. The surface water utility group participates in three Communities of Interest in the Puyallup River Initiative. These involve creating a just and healthy food system, protecting the Puyallup River and protecting Commencement Bay.

The current cross functional approach and matrix structure of Tacoma Environmental Services is part of the groundwork for change to create a utility of the future. As conditions change, utilities must navigate a transition to a new paradigm in which sustainability and innovation become core values through the integration of resources. Our utility of the future will be designed according to these key principles which are inherently connected to our goals and objectives – focused on achieving unprecedented levels of sustainability and innovation.

**Principles of Tacoma Environmental Services Utility of the Future:** Tacoma’s utility of the future provides wastewater treatment, surface water management, and solid waste management services in an integrated way that optimizes the use of resources and eliminates waste. Key principles include the following:

- Apply systems thinking and financial, social, and environmental analysis to all management decisions, including design, construction, operations, and maintenance.
- Do no harm and go beyond compliance.
- Include success measures based on environmental, climate, and other nonfinancial performance criteria.
- Right-size facilities and operations for the customer base, and allow for future flexibility.
- Leverage diverse sources of financing.
- Engage customers as resource management partners.

Tacoma Environmental Services will continue to evolve into a utility of the future through a framework of change that reflects our values, aligns with our goals and objectives, and supports our mission and vision

Tacoma's Environmental Services Department is committed to making and maintaining the programs, systems and services vital to being a Utility of the Future. Strong programs are in place to engage employees in a collaborative organization dedicated to continuous improvement, supportive of wise risk-taking and innovation. Internal and external training opportunities are available to all employees, along with both formal and informal approaches to growing a new core of leaders. Tacoma has a long-standing history of success with beneficial biosolids use, a powerful partnership with community gardens and other community-based programs, and an energy-savings program that has been recognized by Washington's governor. The department has established systems to ensure that these areas remain among the top programs in the nation, while strengthening performance in other Utility of the Future activity areas.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

The Environmental Services Strategic Plan outlines the utilities' commitment to the environment, customer service, financial management and effective operations. This includes continuous improvement and employee development.

Environmental Services Wastewater Utility is ISO 14001 certified and is committed, through this process, to minimize significant environmental impacts, comply with all rules and regulations, continually improve and evaluate our processes, and educate and train our staff.

Tacoma ES has a comprehensive Strategic Training Plan that identifies annual training targets.

### *Performance Measures & Results*

- 100% CEU attainment by all operators All operators met their CEU requirements
- ISO 14001 compliance with requirement of employee knowledge of ESMS policy 100% compliance

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

The City of Tacoma biosolids program (TAGRO) recycles all of the biosolids produced in Tacoma. The majority of the biosolids are used by local gardeners. TAGRO had nearly 7000 paying customers in 2015 and brought in over \$500,000 in revenue to the City.

TAGRO partners with Pierce Conservation District, Pierce County Public Works and Metro Parks Tacoma to promote, create and manage community gardens and community gardening. This program has resulted in 76 community gardens in the county. Virtually all of these community gardens use biosolids products.

TAGRO developed three value-added lawn and garden products and has developed strong local markets for all three.

### *Performance Measures & Results*

- Percent of biosolids beneficially reused 100%
- Gross revenue from Biosolids sales \$564,652
- Number of Customers served annually 6809

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Stakeholder engagement meetings with craft brewing industry

Monthly meetings with Community Garden Steering Committee

EnviroChallenger Education Program: Elementary and middle school programs

Green Tacoma Partnership: Monthly meeting with community stakeholders on environmental issues

Partnership with Solid Waste utility to divert food waste from the landfill to the digesters for production of biogas and soil amendments.

#### *Performance Measures & Results*

- Increase number of Community Gardens: Increased from 36 to 74
- Increase acres of green space: Increased from 47.5 acres in 2014 to 57.5 acres in 2015
- Participated in three de-pave projects: Reduced impermeable surface area in three neighborhoods
- Tons of food waste diverted from the landfill: 600 tons per year diverted, half of which was used to generate biogas and half was used to manufacture compost

#### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Developed a detailed Energy Map for the entire 150 mgd Central Wastewater Treatment Plant (CTP) that graphically maps out all horsepower used at the facility. This map has detailed acuity down to the 1 hp motor level. The map, which is regularly updated as the facility's vast electrical system undergoes changes, is used by Operations to help make operational decisions to reduce electrical consumption.

Developed a detailed model that predicts the CTP's electrical consumption based on the volume of wastewater treated (kW per mgd treated). This model allows the Utility to monitor the implementation effectiveness of energy savings measures (actual electrical usage versus the predicted usage at a given treatment volume), and allows for overall monitoring of electrical consumption trends.

Participation with nine other regional industrial power users as part of a High Performance Energy Management Program, collaborating to reduce electrical consumption through developing and implementing operational changes.

Installation of real-time power monitoring to allow facility operations staff to closely monitor electrical consumption throughout the facility and make adjustments to keep electrical consumption at optimal points during any given wastewater treatment flow condition.

Development and ongoing maintenance of an Opportunity Register designed to record and track implementation progress on energy savings ideas that have been developed by the CTP Energy Team and other O&M staff members. This Opportunity Register is core to ensuring that the facility keeps *striving for improving electrical consumption and not settling for the status quo.*

### *Performance Measures & Results*

- Reduce electrical consumption by 10 percent over a five year period ending in October 2016 - at the Central Wastewater Treatment Plant ( 150 mgd peak flow secondary treatment plant)
- The Utility exceeded this performance goal in the third year of the five-year performance measurement period by reducing overall electrical consumption by 14.5 percent. It important to note that this reduction of electrical consumption is based on kW per million gallons treated; therefore it factors in seasonal changing of wastewater volumes treated.

## City of Tucson/Tucson Water AZ



### City of Tucson / Tucson Water AZ

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Community Partnering & Engagement
- ★ Water Reuse

Utility Description (combine all plants if a multi-site system)		
Type: Large Municipal Water Provider		
Service Area (square miles): 400	Average annual daily flow (MGD): 85	
Population Served: 717,875		
Location		
Street Address: 310 West Alameda Street		
City: Tucson	State: AZ	Zip Code: 85701
Contact Information		
Name: Jeff Biggs	Phone: 520-837-2111	Email: jeff.biggs@tucsonaz.gov



**NARRATIVE:** In 2015, Tucson Water finalized its Strategic Plan, a living document intended to guide the Utility and align its management with its organizational goals. Tucson Water's 2020 Strategic Plan recognizes organizational culture as a top priority for the entire utility. To that end, the Plan was developed around a set of core values – behavioral and business, that represent the foundation of the decisions and activities of the Utility. Employees from all divisions of the Utility, of all positions, worked together to agree on the below core values that embody the Utility's culture.

#### Behavioral Values

- Integrity
- Respect
- Collaboration
- Commitment
- Responsibility
- Leadership

#### Business Values

- Safe high-Quality Water
- Reliable Water Supplies
- Reliable Water Services
- Exceptional Customer Service
- Sound Planning
- Appropriate Investment
- Sound Financial Management
- Protecting the Environment
- Increasing Efficiency and Conservation
- Transparency and Communication

The Plan adheres to these clearly communicated core values that resonate with our employees and our community. Building a positive organizational culture is an on-going initiative for Tucson Water. The Utility understands that a successful organization is not the result of any one person, but the culmination of the efforts of every employee. To foster this culture, Tucson Water provides continuous opportunities for professional development and training to all of its employees. Additionally, divisions manage their own budgets for travel and training expenses, with which they can send employees to conferences, summits, and other professional venues. Staff meetings are held regularly, and all employees have the chance to provide insight and input. Employees are also offered the option to participate in a job-shadowing program to explore their other interests. Supervisors are encouraged to recognize their employees for their hard work through an employee recognition and rewards program, and the Utility formally recognizes all employees at an annual celebration. The core values extend beyond the development of an organizational culture, and seep into the community and the Utility's water management strategies.

It has never been more important for water utilities to make efficient and intelligent plans regarding future resources and infrastructure. In order to secure the public support and investment needed to advance those plans, a utility's planning process must align with the values of the community it serves. Conservation and education outreach programs and integrated customer service processes strengthen the Utility's reputation as a dependable service provider for current and future customers, and standards set in every aspect of operation provide accountability for the Utility to the community at large. To ensure that the Utility is meeting the public's expectations, as well as achieving its goals,

Tucson Water's Strategic Planning process includes setting standards in every aspect of operation. As a standards driven organization, each division of the Utility is responsible for setting performance measures and tracking metrics for those measures. This dedication to standards provides Tucson Water with the ability to assess its progress and respond immediately when changes are necessary. Through standards the Utility achieves accountability not only internally, but to the community at large. Tucson Water works closely with a Citizens' Water Advisory Committee and with the City Manager, Mayor, and City Council to ensure that the community has every opportunity to communicate with the Utility and provide input and feedback. These relationships have been crucial to the community's support of the Utility's initiatives, such as water reuse and watershed stewardship.

Issues related to treatment and public acceptance can often delay and defer water reuse programs. However, the Utility's strong ties to the community and reputation built on transparency and trust have allowed us to fully develop a water reuse program. Previous successes with the recharge and recovery of potable water have led to considerations of another recharge and recovery program. This program would provide additional treatment and storage of reclaimed water supplies and recycle the water for potable reuse. Tucson Water currently allocates the majority of its reclaimed water for non-potable uses, such as irrigation and industrial processing. This system, first established in 1984, now delivers about 15,800 acre-feet of reclaimed water annually, keeping parks, golf courses, and schoolyards green. The availability of unallocated water, coupled with the historic drought and threat of reduced Colorado River water supplies, led Tucson Water to complete its Recycled Water Master Plan in 2013. The Plan is part of a Recycled Water Program that sets a detailed path for developing potable reuse during the next decade. Tucson Water will use its learned expertise in recharge and recovery in our high desert landscape to help ensure the most beneficial and sustainable use of our precious potable and recycled water supplies into the future. Water reuse is still only a part of the Utility's overall watershed stewardship practices.

Tucson Water's Strategic Plan and Recycled Water Program clearly communicate the Utility's priorities in relation to watershed stewardship. From protection of the region's precious groundwater through the use of renewable supplies, to conservation and education programs, to the Recycled Water Program, the Utility constantly works to reinforce the value of every drop of water in the desert. The Utility also works with other water providers to help deliver renewable water supplies to other communities in the region. Additionally, Tucson Water supports and encourages green infrastructure inside the city through education and rebate programs for water conservation and efficiency measures such as rainwater harvesting, curb cuts, and low-flow toilets. The Utility also recognizes the importance of supporting the entire ecosystem and Tucson Water voluntarily engaged in a Habitat Conservation Plan for 22,000 acres of retired farm properties it owns. These lands are now in various states of restoration. Watershed stewardship is not accomplished in isolation, and Tucson Water works with its regional and the community to engage in regional watershed stewardship.

It is through the dedication and effort of every employee that Tucson Water is able to achieve such great lengths. It all begins and ends with the organizational culture of the Utility. The communication of core values, and more importantly, the demonstration of core values in action drive Tucson Water to continuing innovation and success with the support of the community behind us.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed
  - Establishes an integrated and well-coordinated senior leadership team
  - Provides opportunities for employees to find and fix inefficiencies, share ideas for solutions to problems
  - Drives an awareness and commitment to workplace safety
  - Maintains attention to employee morale including opportunities to celebrate victories for the utility
  - Established periodic tracking of progress toward meeting goals and milestones
  - Financial sustainability which could take the form of asset management; long range financial planning and policies or developing new business models to diversify income or leverage other investors

### *Performance Measures & Results*

- Leadership Training Courses: Positive review of leaders,
- Meeting Attendance/Participation: High employee participation and engagement
- Job Shadowing Program Participation: Positive employee feedback, program improvement
- Voluntary Professional Development: High employee participation and engagement
- Employee/Customer Focus Groups: Feedback incorporated into final decision/product

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)

- Web presence established with social media engagement
- Outreach conducted with other stakeholders and other community groups
- Community workforce development programs in place
- Actively promotes community awareness of the value of water and wastewater and stormwater collection and treatment's role in the social, economic, public, and environmental health of the community
- Involves stakeholders in the decisions that will affect them, understands what it takes to operate as a "good neighbor," and positions the utility as a critical asset to the community

*Performance Measures & Results*

- Community Outreach Meetings: Moderate participation by community
- Citizens' Water Advisory Committee: Provides direction and support of important Utility initiatives such as rate increases
- Customer Focus Groups: High participation and feedback
- Social Media Tracking: Support from local business and partners

**WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)
- Development of programs to reduce risk of reuse and improve guaranteed reuse water quality
- Potable reuse for downstream water supplies
- Steps in communicating to the public the realities of potable reuse
- Internal plant methods to insure treated water quality fit-for-purpose reuse
- Use of in-house or external laboratories for testing water quality parameters

*Performance Measures & Results*

- Customer Focus Groups: Support for water reuse initiatives
- Citizens' Water Advisory Committee: Support for initiatives and suggested improvements
- City of Tucson Mayor and Council: Support for initiatives and funding
- Pilot Program: Establish baseline
- Water Quality research/testing: Research and testing of infiltration, UF, RO, and other treatments

## Clayton County Water Authority GA



### Clayton County Water Authority GA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Water Reuse

Utility Description (combine all plants if a multi-site system)		
Type: Water, Sewer and Stormwater Utility		
Service Area (square miles): 143	Average annual daily flow (MGD): 25	
Population Served: 275,000 Residents with 76,000 customer accounts		
Location		
Street Address: 1600 Battle Creek Road		
City: Morrow	State: GA	Zip Code: 30260
Contact Information		
Name: Suzanne Brown	Phone: 770-960-6972	Email: Suzanne.brown@ccwa.us

**NARRATIVE:** Clayton County Water Authority's (CCWA) long term strategy has been geared toward answering these questions: What do we stand for? What sets us apart? How will we achieve long-term success? Our 10 year Strategic Master Plan aligned with the attributes of an effectively managed utility guides us while we focus on finding solutions to these questions that will help us remain an industry-leading utility.

#### ORGANIZATIONAL CULTURE

## Collaborative Culture

Our success is a result of a collaborative culture of employees from all departments, at every level, working on projects, initiatives and programs that help us create the Utility of the Future today. For CCWA's 60<sup>th</sup> anniversary in 2015, a rebranding project was initiated to create a new mission statement and new logo to reenergize employees about what we do, why we do it and what set us apart from our peers. In 2016, we created a new vision statement with input from a visioning team made up of younger employees. The visioning team presented their predictions to senior management, and their ideas were incorporated in the final vision statement.

From our Tap on the Go outreach campaign to our Hydrant Meter Process Improvement project, employees from all levels and departments work as a team to find new ways to educate customers or improve the efficiency of a process. We celebrate our employees through an annual Water Professional's employee cookout, an Annual Employee Appreciation Day (that includes family members) and an Ambassador Luncheon where employees involved in community outreach are recognized.

Your Performance Measure(s)	Your Results (quantitative or qualitative)
➤ Rebranding/Visioning Team	<ul style="list-style-type: none"> <li>• Nine member "Brand Champion" committee produced new logo</li> <li>• (20) young employees' ideas incorporated in 2016 Vision statement</li> </ul>
➤ Tap on the Go Project	<ul style="list-style-type: none"> <li>• Eight member committee developed public education campaign in fall 2015 to teach about value of tap water</li> <li>• We have reached 2,500 customers during (8) events since the campaign was launched.</li> </ul>

## Employee Engagement Surveys

The most important guarantee for long-term success is having employees who are dedicated about what they do, so we launched Employee Engagement Surveys in both 2012 and 2015 while working with a survey company. The results showed how strong our company culture is, and employees firmly believe in what we do. The key to the process was taking action, where performance needed improvement, with written action plans.

Your Performance Measure(s)	Your Results (quantitative or qualitative)
➤ Employee Engagement Surveys	<ul style="list-style-type: none"> <li>• 84% participation (2015)</li> <li>• Best-in-Class recognition - as an effective organization</li> <li>• Significant increase in overall score-employees know they contribute to mission, serve customers and work under safe conditions.</li> </ul>
➤ Voluntary Employee Turnover	<ul style="list-style-type: none"> <li>• 6.5% (FY 15-16)</li> </ul>

	<ul style="list-style-type: none"> <li>• 7.0% (FY 14-15)</li> <li>• 9.3% (FY 13-14)</li> </ul>
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### Succession Planning

Concerned with the “graying of the industry”, CCWA proactively took the initiative to implement succession planning to identify critical employees and their replacements. After identifying the latest Leadership Competencies and translating them into an assessment tool, every manager and supervisor was evaluated. A Talent Development Review Committee (TDC) was formed.

Your Performance Measure(s)	Your Results (quantitative or qualitative)
➤ Leadership Competency Model	<ul style="list-style-type: none"> <li>• Identified (11) competencies and work examples per competency</li> </ul>
➤ Leadership Assessment Tool	<ul style="list-style-type: none"> <li>• Assessment developed; (15) managers and (40) supervisors assessed with feedback</li> </ul>
➤ Supervisors evaluate employees : <i>Ready, Developing Talent, Consistent, Opportunity</i>	<ul style="list-style-type: none"> <li>• Presented evaluations to TDC; results: company-wide organizational chart of talent</li> </ul>
➤ Review Committee updates current/projected openings	<ul style="list-style-type: none"> <li>• Meet quarterly</li> </ul>
➤ Promote from within whenever possible	<ul style="list-style-type: none"> <li>• 80-85% based on LOS report</li> </ul>

### Training and Development

We have made a major investment in internal/external industry training for all employees. We also partner with Clayton State University for IT interns and University of West Georgia for water reclamation interns. Our Summer Internship program for high school and college students provides them the opportunity to “learn as they earn” while encouraging interest in future water industry careers.

Your Performance Measure(s)		Your Results (quantitative or qualitative)
<b>Senior Management Team</b> <ul style="list-style-type: none"> <li>➤ Five Behaviors of a Cohesive Team (Lencioni) training</li> <li>➤ DiSC Workplace Communications Skills workshop</li> <li>➤ Annual retreats</li> </ul>	•	<ul style="list-style-type: none"> <li>• (15) managers completed 28 hour program</li> </ul>
<b>Supervisors</b> <ul style="list-style-type: none"> <li>➤ Five-module <i>Genuine Leadership</i> program</li> <li>➤ HR Policies &amp; Procedures, Managing Harassment, Inclusion &amp; Violence at Work</li> </ul>	•	<ul style="list-style-type: none"> <li>• (60) managers &amp; supervisors (30) sessions</li> </ul>

➤ Georgia Association of Water Professionals Leadership Academy	•	• (2) supervisors attend each year
<b>Employees</b> ➤ Selected employees attend <i>Habitudes</i> program: focus on preparing for future leadership ➤ Plant Volunteer program prepares employees for future operator positions ➤ Annual Mini Conference ➤ Annual Training Day ➤ Coach/Mentor program	• • • • •	• (22) employees completed (2015-16) • (3) employees moved to operator positions (2015) • (80) employees (earn points for certification) • (369) employees - full day of training activities • (30) supervisors will be trained in early June 2016
<b>Other</b> ➤ Summer Intern Program ➤ University of West Georgia	• •	• (4) interns each summer - (2) hired in past two years • (2) interns hired in past four years

**Financial Viability**

CCWA takes pride in its financial position that combines an excellent debt service coverage factor of 2.27x with the lowest water/sewer rates in the metropolitan Atlanta area.

Your Performance Measure(s)	Your Results (quantitative or qualitative)
➤ GFOA Financial Reporting Excellence Award	• CCWA has won the award for last 29 consecutive years
➤ GFOA Distinguished Budget Presentation Award	• CCWA has won the award for 10 years

**WATER REUSE**

**Reuse Strategy:** Despite having limited surface or ground water supplies, CCWA has developed a truly sustainable water supply through the utilization of constructed treatment wetlands for augmentation of surface water supplies. The Water Authority partnered with our consultant, CH2M, to develop our unique “planned” indirect potable reuse system consisting of advanced wastewater treatment at mechanical plants followed by constructed wetlands treatment and discharge directly back to water supply reservoirs. CCWA employs a UV disinfection process at all of the drinking water production plants to provide an additional barrier to microbiological and chemical contamination. CCWA ventured into utilizing natural treatment systems for reclaiming wastewater in the 1980s. Since then, CCWA has invested millions in



creation of a sustainable indirect potable reuse system. The centerpiece of this investment is the constructed wetlands system that utilizes the land and was built to last for many years with very little maintenance upkeep. This innovative reuse system garners industry recognition and interest from around the world.

Your Performance Measure(s)	Your Results (quantitative or qualitative)
<ul style="list-style-type: none"> <li>➤ Average amount of reclaimed water used to augment supplies</li> </ul>	<ul style="list-style-type: none"> <li>• 17.5 MGD discharged to (2) watersheds serving (5) reservoirs</li> </ul>
<ul style="list-style-type: none"> <li>➤ Ratio of Reuse water to natural flow in reservoirs</li> </ul>	<ul style="list-style-type: none"> <li>• 50-80% depending on the weather</li> </ul>
<ul style="list-style-type: none"> <li>➤ Independence from Interconnection Water Supplies</li> </ul>	<ul style="list-style-type: none"> <li>• Have minimized usage of these connections since constructed wetlands were put online</li> </ul>
<ul style="list-style-type: none"> <li>➤ Environmental Benefits</li> </ul>	<ul style="list-style-type: none"> <li>• Provides a wetlands habitat in the middle of an urban area</li> <li>• Facilities are used for scientific research and natural treatment system education</li> <li>• Recreational amenity for bird watchers, hikers, etc.</li> <li>• Smaller carbon footprint, as our system requires much less energy for treatment</li> </ul>
<ul style="list-style-type: none"> <li>➤ Climate Resiliency</li> </ul>	<ul style="list-style-type: none"> <li>• During the worst drought in our area, in 2009, CCWA reservoirs never went below 69% full, while our neighboring utilities' reservoirs approached dangerously low levels.</li> <li>• Case study example in last Climate Resiliency report by Federal government</li> </ul>
<ul style="list-style-type: none"> <li>➤ Internal Reuse</li> </ul>	<ul style="list-style-type: none"> <li>• All CCWA water reclamation facilities utilize reuse water for processes, wash downs and irrigation.</li> </ul>

## ***Clean Water Services OR***



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### **Clean Water Services OR**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Community Partnering & Engagement**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Watershed Stewardship**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type: Regional system, 4 plants, stormwater, conveyance, water supply, resource recovery		
Service Area (square miles): 122 square miles	Average annual daily flow (MGD): 60 MGD (dry weather)	
Population Served: 572,000		
<b>Location</b>		
Street Address: 2550 SW Hillsboro Hwy		
City: Hillsboro State: Oregon	Zip Code: 97123	
<b>Contact Information</b>		
Name: Mark Jockers	Phone: 503.681.4450	Email: JockersM@cleanwaterservices.org

**NARRATIVE:** Becoming a Utility of the Future

Clean Water Services was formed in 1970 as a regional wastewater utility that relied on old-school pipes, pumps and plants to clean water. By the 1990s we'd expanded our mission to stormwater, water reuse and water supply. All along we've kept our eyes on the bottom line for our ratepayers. And, we were into sustainability early on because we got the connection between a healthy economy, clean water and natural areas. We pioneered resource recovery, first with biosolids and recycled water, then with the Ostara facilities and Clean Water Grow. We are moving toward energy independence with solar power and co-generation, and transforming waste to watts using fats, oils and grease. With our agricultural partners, we are growing shade to lower river temperatures and enhance habitat. At Fernhill we are building natural treatment wetlands in harmony with people and wildlife. Our unique, first-in-the-nation watershed permit allows expansive latitude for innovations that conserve natural resources while lowering costs. We encourage and reward the visionary risk-taking that precedes technological innovation, and are known for operating with the agility of a profit-based business. We have a clear commitment to do what's best for the ratepayer and the watershed, and a long history of embracing the future while controlling our destiny.

Cultural Activity – A key to our success is creating a team environment, exemplified by an annual goal sharing program since 2003 where employees develop objectives, measures, and targets that propel us toward ever greater achievement with financial awards. The goals are aspirational and tough, with an average accomplishment rate of about 60 percent annually, and even with targets that are not met there is significant forward progress and employees are incentivized to achieve more.

Understanding what each member of the team contributes to the larger whole helps provide context and support for every employee every day. Visiting and engaging with staff in other groups and locations develops a deeper appreciation of what how seemingly disparate tasks are connected. Even when projects involve most of the departments, it is important to take the time for staff to become familiar with the projects. An example is when the Finance group was encouraged to visit the new Fernhill natural treatment system, and they returned to the office able to explain how nature and improved habitat connects to the treatment process and improved water quality. Although processing contracts, invoices and payments can be dry, our Finance staff now shares the pride of creating beautiful clean water in our community.

Community Partnering & Engagement – This is the stuff at which the Utility of the Future must excel. We must connect with many communities of interest and partners, as well as our ratepayers. Clean Water Services has a long history of stakeholder engagement, public education and outreach, and partnering with our member cities, regulators, the environmental community, and many other interest groups. We received the nation’s first watershed permit due to strong partnerships with the Oregon Department of Environmental Quality and the support of environmental groups including the Tualatin River Watershed Council and Tualatin Riverkeepers. Together we are improving water quality, building social capacity, building the economy, and enhancing natural habitat throughout the Tualatin River Watershed--all while keeping rate increases low and predictable. A great example of community engagement is the Tree for All Community Tree Planting Challenge, a coalition led by the District since 2005 with its member cities, nonprofits, public land holders and legions of volunteers. In 2015, it met and doubled the One Million Tree Challenge, invigorating the spirit of volunteerism and building social capital while enhancing habitat and the natural beauty of our communities.

Energy Generation & Recovery – The District was an early adopter of energy recovery, installing cogeneration engines running on digester gas more than 20 years ago. The latest modernization with larger engines plus a FOG recovery program produces even more power and keeps the pipes clean. The installation of a half megawatt peak power solar facility moves the Durham Facility closer to net zero power, a long term goal for the entire District.

Nutrient & Materials Recovery – As owner and operator of the first Ostara facility in the U.S., the District leads phosphorus and ammonia recovery for commercial fertilizer. Early on, we had the technology and held a patent that improves the performance of nutrient recovery systems. We established the nonprofit Clean Water Institute to partner with Ostara to promote the technology at other resource recovery facilities across the U.S. and around the world, including the Metropolitan Water Reclamation District of Greater Chicago. The District also created and markets Clean Water Grow, a premium fertilizer sold in nurseries where its packaging also delivers important messages on water quality and nutrient recycling to the greater community.

Watershed Stewardship – Our general manager always asks, “What would Mother Nature do?” The answer led to the creation of a comprehensive watershed program that melds the built environment with the natural world for superior outcomes as our community continues to develop. In an audacious move, our Board approved working outside of our jurisdictional boundaries to partner with farmers, Tualatin Soil and Water Conservation District, Tualatin Valley Irrigation District, the regional government Metro, and federal agencies as well as our member cities and local park districts. Together, we have restored more than 100 miles of stream and river riparian area, and delivered water to restored flow to thirsty creeks. The program is an engine of economic development that has borne thriving native plant nurseries where none existed before. Our combined stewardship has regained natural spaces to the delight and benefit of people and wildlife throughout the Tualatin River Watershed, supporting resiliency for a sustainable future.

We are pleased to be recognized as a Utility of the Future for this prestigious award. We appreciate your gracious consideration of our qualifications detailed below.

## ORGANIZATIONAL CULTURE

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Annual Goal Sharing program since 2003 requires employees to develop and achieve an array of performance targets that impact all departments and support strategic initiatives for innovation, partnerships, and organizational excellence. Interdepartmental collaboration is key to achieving many of the targets which are challenging “stretch” targets. The program rewards employees with financial compensation for achieving the goals.

The Clean Water College and Expert Exchange are trainings taught by consultants and staff to develop skills and prepare for being a Utility of the Future. Course topics include GIS mapping, EPA Atlas, Earthquake Awareness, Mycoremediation of Street Sweeping, Stakeholder Engagement, natural treatment systems pilot studies, workplace organization, public speaking, etc.

“Clean on Screen” is a monthly program that creates brief videos of staff talking about what they do and why they like working for the District. Featured as part of a brown bag District film festival and readily available on the intranet, nine videos have been done for this relatively new program. Employee feedback has been overwhelmingly positive for this novel way to applaud individual contributions to the District’s work.

Business process improvements are continually underway to optimize resources and precious ratepayer dollars. Staff is recognized and rewarded for suggesting improvements that save time, money, resources and improve outcomes. A noteworthy early improvement was Pay for Performance compensation rather than automatic step increases, where pay increases are based on individual contribution to the *achieving the District’s Mission, Vision and Values*.

### *Performance Measures & Results*

- Goal Sharing Program targets met - Since 2003, 60% of the targets have been achieved and paid out.
- College of Clean Water/Expert Exchange attendance - In just the first half of 2016, eighteen trainings were attended by 506 employees
- Clean on Screen employee profile videos - 9 videos to date; showings attended by 250 employees
- Business Process Improvements - 9 Processes documented and improved (FY’16)

## COMMUNITY PARTNERING & ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Maintain customer engagement to measure satisfaction, awareness and support for work in protecting the Tualatin River Watershed. Trending analysis helps inform messaging, program development and its effectiveness.

### Performance Measures & Results

Your Performance Measure(s)	Your Results (quantitative or qualitative)
<i>Develop public-private partnerships and engage volunteers to complete watershed-wide restoration projects that improve the Tualatin Basin's ecology, economy and community.</i>	<p>Tree for All program:</p> <ul style="list-style-type: none"> <li>• Over 35 municipal, private and community partners joined Tree for All.</li> <li>• 5.7 million native trees and shrubs planted 2005-2015. In 2015 alone, two million native plants installed.</li> <li>• 101 miles of stream corridor planted.</li> <li>• 21,400 volunteers engaged in 2004-2015. In 2015 alone, 6600+ volunteers participated.</li> </ul>
<i>Through various social media platforms, regularly engage citizens in water education and behavior-change activities that protect the Tualatin River Watershed.</i>	<ul style="list-style-type: none"> <li>• Mobile-responsive website (<a href="http://cleanwaterservices.org">cleanwaterservices.org</a>) that includes engagement and knowledge modules: One Water, Resource Recovery, Newsroom, and Employee 'Working for the River' video series.</li> <li>• District's website gets an average of 15,000 visits from approximately 8,900 unique visitors per month.</li> <li>• Social media platforms include: <ul style="list-style-type: none"> <li>○ Twitter accounts: <ul style="list-style-type: none"> <li>▪ @Cleanwaternews, 5,154 followers</li> <li>▪ @RiverRanger, 754 followers</li> </ul> </li> <li>○ Facebook pages: <ul style="list-style-type: none"> <li>▪ Clean Water Services, 719 Likes</li> <li>▪ Clean Water Grow, 234 Likes</li> <li>▪ Tree for All, 403 Likes</li> </ul> </li> <li>○ YouTube Channel, 35 subscribers</li> </ul> </li> <li>• <i>Clean Water News</i> electronic newsletter sent to 2900 subscribers per month with 28% average open rate.</li> <li>• Westside Voices online engagement tool (<a href="http://joinwestsidevoices.org">joinwestsidevoices.org</a>) with over 2500 panel members.</li> </ul>

## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

FOG is co-digested with municipal wastewater solids at the Durham Advanced Wastewater Treatment Facility. The FOG receiving station at the Durham Facility receives approximately 70,000 gallons of FOG per week, producing digester gas that doubles the electricity production of the Durham Facility's 1.7 MW cogeneration system.

Heat recovered from the Durham Facility's cogeneration engines is used to heat the Facility's digesters and building spaces.

Clean Water Services is a member of the Hillsboro Sustainability Task Force, a committee which meets regularly to discuss and address sustainability issues.

#### *Performance Measures & Results*

- Increased renewable on-site power generation - 21.5 million kWh
- Reduced reliance on the power grid - 37% of electricity is generated on-site
- REC generation - 12 RECs per year generated
- FOG Received- 280,000 gallons per month
- Biogas produced - 15 million cubic feet per month
- Thermal Energy Produced - 2270 MMBtu/month
- Electricity generated on-site - 20 million kWh

#### **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities
- Recovery of phosphorus for beneficial reuse
- Production and marketing of Clean Water Grow retail fertilizer
- Involving private company in new technology for nutrient recovery/sale.

In 2009, Clean Water Services' Durham Advanced Wastewater Treatment Facility was the first facility in the United States to recover fertilizer using the Ostara struvite recovery system. Clean Water Services then opened the world's largest municipal Nutrient Recovery Facility at the Rock Creek Advanced Wastewater Treatment Facility on May 8, 2012 in Hillsboro. All of the fertilizer produced at these

treatment plants is either purchased by Ostara or used in a retail fertilizer product developed by Clean Water Services called Clean Water Grow.

Clean Water Services uses an aluminum sulfate solution (alum) to treat wastewater at its Rock Creek and Durham treatment facilities. The implementation and refinement of biological phosphorous removal has contributed to a dramatic reduction in alum use at these facilities leading to lower costs and a smaller environmental footprint.

Clean Water Services developed a process called WASSTRIP (Waste Activated Sludge Stripping to Remove Internal Phosphorous) that reduces struvite (magnesium ammonium phosphate) buildup in the operation of anaerobic nutrient removal facilities. WASSTRIP technology saves wastewater treatment plants hundreds of thousands of dollars a year in maintenance and longer facility lives. CWS, through its non-profit partner the Clean Water Institute, signed a licensing agreement with Ostara Nutrient Technologies Inc. that provides the company an exclusive right to sell this technology in major markets around the world.

- *Performance Measures & Results*
- Tons of Crystal Green Produced - 318 (2013), 459 (2014), 464 (2015)
- Stores carrying Clean Water Grow - 5 (2013), 12 (2014), 25 (2015), 32 (2016)
- WASSTRIP Installations - 5 by 2016
- 

#### **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
  - Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
  - Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
  - Ecosystem enhancements for improved hydraulics or water quality, including:
    - Riparian reforestation to enhance pollution mitigation functions
    - Stream channel restoration for increased hydrologic stability
    - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
  - Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.
- 
- Collective Impact Model between aligns diverse groups of partnerships and individuals around ecological enhancement/restoration strategies within stream corridors, linking local actions into a cohesive network, (i.e. Tree for All) to address large and complex environmental challenges, (i.e. thermal load reduction, resilient stream corridors, hydro-modification, urban development) at the watershed scale.
  - Beaver Activity Management Strategy for restoration planning embraces the ecological benefits of beaver activity. The North American Beaver (*Castor Canadensis*) is a keystone species in the Pacific Northwest Ecosystem and beaver dams provide substantial benefits to watershed health, including: increased channel complexity, filtering and settling of sediments, increased



groundwater flow, reduced stream temperature, increased summer base flow, improved floodplain connectivity, and increased habitat for sensitive still water species. Over time beaver dams change the geomorphic character of stream and wetland environments, but they rarely influence flood elevations, therefore the goal of management strategy is to maintain and improve the amount of beaver pond habitat without creating unacceptable risk of damage to other public and private resources.

- Enhanced Ecological Functions of Restoration Memorandum of Understanding between local natural resource partners to lean in on integrated outreach, restoration, stewardship, and management of natural systems at the landscape scale.
- Thermal Load Trading Plan restores ecological processes throughout the watershed. The plan forecast the amount of shade credit and trading required by the NPDES permit. The partnership agreements allow for donated capital and volunteer time to be quantified as avoided cost.
- Agricultural Partnership Program directs partner funding for broader watershed enhancement activities within the farm conservation platform; incorporates new funding sources into landowner incentive program and signs IGAs with entities providing funding for long-term stewardship.
- Flow Restoration Program maximizes opportunities with partners and increases return on investment throughout the watershed; capitalizes on ecological benefits of flow restoration through the establishment of strategic “healthy watershed” metrics, stream restoration crediting, partnership participation, schedule implementation, capacity analysis, and long-term vision.
- Restoration Management Systems and Records Program creates efficient storage and recovery of long-term information; develops process improvements to identify and capture relevant historic project records in a digital format. Team needs and record retention requirements for historical information of project sites is identified, and a staging area for document upload and restoration management system to receive uploads is created.
- Innovation Technology for Restoration Program develops next generation approaches to evaluate and communicate project benefits; applies emerging technologies to demonstrate scope, scale, and outcomes of restoration projects. An objective is to provide visualization and dissemination of information to a broad audience.
- Community Based Stewardship Model for collaborating with community partners develops sustainable paths to stewardship; develops an implementation plan for engaging partners in the long-term stewardship of prioritized community sites across the watershed. Metrics include % acre managed, management period, and partner engagement.
- Capital Project Delivery Model for providing responsive planning and timely implementation of capital projects ensures compliance with regulatory requirements and supports regional land use planning goals; develops, performs, and provides oversight of proactive, cost-effective, and efficient maintenance and operation programs which maximize useful life of capital assets and the economies of scales of being a regional service provider.
- Natural Resource Monitoring Application improves vegetative corridor assessment data collection. A standard reporting format for SPL applications was created to provide ecological baseline data consistent with existing monitoring protocol.

- Stormwater Real Time Control (RTC) & Storm Analysis Tool improves the efficiency and performance of existing and proposed surface water retention facilities. The storm analysis tool provides near real-time characterization of storm events
- Region Specific Low Impact Development (LID) Guidance and Details for successful LID implementation, design, and construction. Providing updated data, handbooks, standard details, and planting guidance on lessons learned during the design, construction, and maintenance of real projects completed within the watershed. Field Operations Production Efficiency Application with dashboards that harnesses current and past Lucity production data.
- Field Operations supervisors and crews use this application in planning, implementing, and monitoring Field Operations daily work in order to meet the current performance indicators, including work order target completions, work order percent complete, frequency of evaluations, performance projections, benchmarks and targets.
- Stormwater Phase II Strategy provides ecosystem services uplift through integrated stormwater control; includes hydro-modification, retrofit, and post-construction components that comply with municipal stormwater components of the watershed based NPDES permit.
- Laboratory of the Future ensures effective and timely information for compliance, operations, and environmental assessments; demonstrates progress towards adoption of new laboratory measurements and approaches that will ensure focused, timely and cost-effective services in the future.
- Cold-Water Refuges Flow and Habitat Restoration approach restore ecological functions in priority resource areas. Cold-water refuge/fish habitat sites are created, maintained, and/or enhanced based on rapid biological assessment and physical monitoring. Strategy includes integration into existing regulatory framework and prioritization for riparian planting, flow restoration, fish habitat enhancement.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Thermal load reduction (Kcal) from riparian shade (2015)	400,000,000
Stream miles enhanced (2015)	103
Partner Investment leveraged (2015)	\$550,000
Number of community partners investing (2015)	17
Total acres of donated capital for restoration (2015)	3,500
Native plants planted by Tree for All Community partners (2015)	2,100,000
Volunteers in community restoration events (2015)	6,600
Enhancement of tributary flows through integrated flow management (ac-ft) (2015)	1,226
Agricultural lands enrolled in water quality management program (acres) (2015)	8,000
Laboratory of the Future White Papers	Produced (5) white papers addressing topics to increase the use of new measurement technologies (e.g. probes, automated sensors) for both wastewater operations and ambient monitoring, better methods to assess ecological uplift, application of techniques such as genomic sequencing and polymerase chain reaction (PCR) to monitor effective biological treatment processes, reduction of the need for routine analytical chemistry (e.g. TSS, TDS) for process control, and development of methods to ensure environmental compliance related to copper.
Stormwater Real Time Control	Reduced volume and duration of channel forming discharges by 25% (wet detention). Reduced the volume of erosive flows by nearly 60% and the volume of wet weather discharges by nearly 70% compared to a passive basin (dry detention). The use of real-time control reduced the required pond volume by 30-50%, compared to a passive facility while achieving the same level of flow-duration control performance. Approximated three times lower lifecycle cost than equivalent passive alternative.
RTC Dissemination	Publication: Kerkez, B., Gruden, C., Lewis, J.M., Montestruque, L., Quigley, M., Wong, P.B., Kertesz, R., Braun, T., Cadwalader, O., Poresky, A., Pak, C. (2016). Smarter Stormwater Systems. <i>Environmental Science &amp; Technology</i> , (Just Accepted).

## Daphne Utilities AL



### Daphne Utilities AL

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery

Utility Description (combine all plants if a multi-site system)		
Type Daphne Utilities is a municipal public utility providing wastewater collection and treatment, as well as drinking water and natural gas services.		
Service Area (square miles): 22	Average annual daily flow (MGD): 3.0	
Population Served: 25,000		
Location		
Street Address: 900 Daphne Avenue		
City: Daphne	State: AL	Zip Code: 36526
Contact Information		
Name: Danny Lyndall	Phone: 251-626-2628	Email: danny@daphneutilities.com

**NARRATIVE:** The Utilities Board of the City of Daphne (“Daphne Utilities”) provides water, wastewater, and natural gas utility services to the citizens of the city of Daphne and the surrounding communities. It serves a population of approximately 25,000 along the eastern shore of Mobile Bay in south Alabama. Daphne Utilities is a forward-thinking, innovative organization which has long engaged in promoting a culture designed to enhance operational efficiency, to meet and exceed all regulatory requirements, to be exemplary stewards of its resources, and to achieve high levels of customer service.

In 2006, Daphne Utilities began its cultural transformation with the appointment of a new Board of Directors and administrative management staff. New leadership brought a passion for innovation and excellence never before seen at the small utility. A number of initiatives were implemented that first year. Among these early initiatives were programs focusing on operational issues to enhance customer service and community outreach. One of these programs – the “Cease the Grease” campaign – was a residential cooking oil recycling program to reduce the incidence of FOG-related SSO’s. Going beyond similar programs at other organizations, Daphne Utilities created a broad network of cooking oil/grease drop-off locations throughout its service area and heavily promoted the program in the community. Daphne Utilities used the customer-recycled oil to manufacture biodiesel fuel (with a biodiesel processor built from spare parts at its WWTP) and operated its equipment and trucks using the fuel. One of the trucks became a rolling billboard for the campaign with the slogan, “Powered by Biodiesel” emblazoned on the sides, and marketing campaigns to “look for the truck that smells like french fries!”

The “Cease the Grease” program became so popular the utility began receiving more used oil than it could process, but every gallon received was a gallon which did not end up in the sanitary sewer system. FOG-related SSO’s were reduced by 40% in that first year and ongoing FOG-related issues are minimal. Because of the program, customers are regularly reminded of the value of working together with the Utility to reduce sewer spills to protect the environment and to save on the cost of operations (using low-cost biodiesel fuel) which helps keep rates low. The program was recognized by the EPA as an environmental model for other organizations and received the Gulf Guardian Award. The program is also listed on the EPA website in the “wastewater collection system toolbox” (<https://www3.epa.gov/region1/sso/toolbox.html>).

On the heels of this program, Daphne Utilities was firmly entrenched in a culture of community outreach. It became a common site to see Daphne Utilities’ employees at every community event, particularly those related to environmental concerns (i.e., Earth Day, Arbor Day, Coastal Cleanup, etc.). Daphne Utilities sponsors many of these programs and provides fun activities for children. While the children are engaged, staff uses the opportunities to interact with the parents and promote the value of the utility in the community. The Utility regularly hosts field trips for school-age children at its water and wastewater treatment facilities, provides classroom instruction at local schools on water quality and environmental issues, and informational presentations for local civic groups and Chambers of Commerce. Because these activities have become an integral part of the culture, employees of the utility regularly suggest new ideas for events. Employee ideas have included, providing bagged class-A biosolids as a compost starter for the tree giveaways at Arbor Day, and using a giant slingshot to hurl snowballs into Mobile Bay to “combat global warming” (by far the most popular activity at Earth Day). Each year Daphne Utilities’ community presence continues to grow along with its reputation as a valuable community partner.

More recent initiatives addressed by Daphne Utilities in promoting a culture of innovation and excellence are focused on leadership and workforce development. Employees of the Utility are regularly encouraged to pursue additional certifications and training opportunities. In fact, one of the core values of Daphne Utilities is professional development and the organization devotes considerable resources to ensure all employees have the chance to attend internal and external training sessions. As a consequence of its dedication to employee development, Daphne Utilities was named by Inc. Magazine as a one of its 10 Best Small Workplaces in 2011. Other recent programs include: the Leadership Academy, a year-long in-house training program for employees identified to be the future leaders of the Utility; a partnership with the local Chamber of Commerce to sponsor high school youths in pursuit of technical careers following graduation; a program in partnership with a local community college to provide water and wastewater certification programs; and the recent attendance by several of the Utility's managers at the Disney Institute program for Employee Engagement.

The above are but a few examples of the many ways Daphne Utilities has transformed its culture over the past ten years from the typical small-town utility to an organization which promotes and celebrates excellence. Along the way, it has established itself as a valuable community partner and built an excellent reputation as a well-run organization. Daphne Utilities regularly receives commendations from its customers for the courtesy and professionalism of its staff and it has been recognized at the local, state, and national level for its excellent programs, including:

- EPA Safe Drinking Water Excellence Award
- EPA Consumer Confidence Report Award of Excellence
- EPA Gulf Guardian Award
- AWWA-AL/MS Section Plant of the Year (Water Treatment)
- AWEA Excellence Award (Water Reclamation Facility)
- Alabama League of Municipalities Municipal Achievement Award
- Baldwin County (AL) Environmental Responsibility Award
- Eastern Shore Chamber of Commerce Environmental Award
- AWPCA Best Operated Plant and Awards of Excellence (Water Treatment and Water Reclamation)

We appreciate your consideration of Daphne Utilities for Utility of the Future recognition and would be honored to be included in the program.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees

- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

An integrated and well-coordinated senior leadership team are essential to Daphne Utilities’ success. This group works closely together to pursue the mission and vision of the organization. In fact, the current leadership team developed the current strategic plan of Daphne Utilities over a half-dozen meetings in the past 6 months.

The Utility has developed several incentive programs to encourage front-line employees to suggest innovations, improvements, and to voice safety concerns. During regular company meetings, these ideas are discussed and the best ideas are implemented.

The employee who suggested the idea is publicly recognized and provided an award. Daphne Utilities has several standing committees comprised of front-line employees only. These include the safety committee, events committee, newsletter committee, and community outreach. Allowing employees this level of input into the organization encourages engagement and leads to high levels of loyalty, dedication and commitment.

The employee safety committee is very organized and active throughout the year. Employees provide training in fun and interactive ways (i.e., Safety Jeopardy Game Show, skits, etc.), and successes are celebrated. After-action and close-call investigations are always performed following an incident (internal or external to other organizations) to identify lessons which can be applied.

From a financial standpoint, the Utility has adopted a full-cost recovery model to ensure rates and non-recurring revenue (impact fees) are sufficient to fund operations. In addition, the three business units (water, sewer, gas) are also operated at cost recovery such that no business unit subsidizes the other.

Long-range capital improvement plan (CIP) has been developed and is updated annually. All departments are required to submit new projects (or updates to existing projects) each year along with a business case analysis to provide justification for inclusion in the CIP.

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Customer Satisfaction and Community Outreach (events sponsored/# of individual impressions)	Regular surveys of customer satisfaction are taken through Daphne Utilities' website. These consistently show "satisfied" or "very satisfied" customers. Community outreach is measured by the number of people and the amount of impact the Utility achieves by participating in the community events. Certain events and activities (i.e., "snowball activity" listed above) have become so popular, community members go out of their way to attend events where Daphne Utilities is participating.
Employee Development (number of new certifications, promotions qualified for)	10% of water and wastewater workers have obtained W/WW certifications in the past 12 months. Another 5% of workers have obtained other types of specialty training/certification in other areas including finance, customer service, employee engagement. 9% of employees are currently undertaking Leadership Academy certification which, when complete, will make them eligible for supervisory positions.
Financial Metrics (Revenue/Debt ratios, bottom-line goals, project funding requirements met)	We have maintained revenue to debt ratios at the highest level placing the Utility in excellent financial position. S&P ratings have been increased 2 times in 5 years and currently stand at AA with a stable outlook. Revenue consistently hits targets and expenses are consistently below projections – resultant net income is maintained at a level sufficient to meet all capital funding requirements.
Resource Efficiency (# employees per customer)	Through the past ten years of improving efficiencies and seeking greater operational effectiveness, customers have increased from 139 to 182 customers per employee. This illustrates our Utility become leaner and more effective while increasing the overall level of service and satisfaction of our customers.

## **BENEFICIAL BIOSOLIDS USE**

- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

### *Performance Measures & Results*

- lbs of biosolids diverted from landfill - Daphne Utilities was one of the first utilities in this area making a class-A biosolid more than ten years ago. In 2012, a new and more energy efficient dryer was installed with a cutting head at the end of the process to make a more uniform granular product. As a result, DU biosolids are in high demand from sod farmers and golf courses. Consequently, every pound of biosolid is land applied rather than taken to a landfill.
- Bags of "compost starter" given away at Arbor Day festival - 5lb bags of biosolids are given away to citizens at the annual Arbor Day Festival in February each year. The bags have information about the beneficial use of biosolids and instructions for amending the soil/compost. These have become very popular with the citizens of our area and we receive calls throughout the year from



individuals seeking additional biosolids for their yards. The bags given away has increased from 100 bags the first year to over 1,000 bags this past February.

## COMMUNITY PARTNERING & ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement
  - The aforementioned community outreach events are the primary activity indicating our partnership and engagement. We seek out every opportunity to positively place ourselves in the public eye recognizing the value of building community goodwill. We strive to be known as a well-run organization which fully supports all activities in our community.
  - Hold community meetings with the affected public when we are in the planning phases of new projects. We also hold update meetings and face-to-face outreach with the public while projects are ongoing to ensure the community is satisfied with our efforts.
  - Currently in the process of building a classroom / laboratory setting at the WRF for teaching school-age children the benefits and value of water / wastewater infrastructure. This facility also includes a community garden with plants grown using biosolids as fertilizer and reuse water for irrigation.
  - *Performance Measures & Results*
  - Strong social media presence as indicated by the number of impressions, likes, reach, and engagement. With the hiring of a dedicated public relations / marketing professional, we have committed to social media as a means of community outreach. We continue to refine our mediums (currently Facebook , Twitter, and LinkedIn) and the messages we put out. Our social media presence continues to increase and total engagement is greater than 100% across all platforms.
  - Special projects constructed WRF classroom began construction in late 2015 and is 90% complete. Community garden is 100% complete. Future projects include a boardwalk through a designated wetland area for environmental education activities.
  - Formal Recognition Numerous awards received each year (see partial list above) from local, state, and national organizations recognizing Daphne Utilities' operational excellence, environmental stewardship, and community outreach.

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)

- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy efficient retrofits of equipment in the water and wastewater treatment and conveyance systems. Nearly all motors have been converted to VFD or soft start controls. At the WRF, 5 positive displacement blowers were replaced with 3 energy-efficient turbo blowers.

LED lighting is being retrofitted throughout the system to replace outdoor floodlights and indoor office lighting.

#### *Performance Measures & Results*

- Reduction in energy usage at the WRF As a result of the installation of turbo blowers at the WRF for aeration basins, energy costs have been reduced by \$60,000 per year.
- Reduction in energy use throughout conveyance system As a result of the installation of new drives on motors throughout the sewer pumping stations, there has been no appreciable increase in total electrical cost over the past five years – even with the addition of 4 new pump stations (bringing the total to 79 stations).
- Reduction in cost through lighting upgrades This is an ongoing project therefore cost savings cannot be quantified as yet. We fully anticipate cost reductions from the longer life of the LED bulbs and the reduced energy consumption.

### **ENERGY GENERATION & RECOVERY**

- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)

Create a biodiesel fuel from used cooking oil to use in Utility trucks and equipment.

#### *Performance Measures & Results*

- Gallons of cooking oil recycled into biodiesel fuel We collect approximately 400 gallons per month of used cooking oil which converts to 100 gallons of biodiesel. The cost of collecting and making the fuel is more than offset by the reduced maintenance and reduced SSO incidence within the sanitary sewer collection system.
- Cost savings over the purchase of diesel fuel It costs approximately \$1.00 to make biodiesel (using the free feedstock of recycled cooking oil) and we produce about 1200 gallons per year. In previous years when petroleum-based diesel approached \$5 per gallon, we saved \$4800 per year. Recently we have seen a more modest savings as the cost of petro-diesel have come down.

## DC Water Washington DC



### DC Water Washington DC

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Energy Generation & Recovery

#### Utility Description (combine all plants if a multi-site system)

Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.):

DC Water provides retail water and wastewater (sewer) service to the District of Columbia.

DC Water provides wholesale wastewater treatment service to Montgomery and Prince George's counties in Maryland and Fairfax and Loudoun counties in Virginia.

Service Area (square miles):

DC Water's service area is approximately 725 square miles.

Average annual daily flow (MGD):

Avg daily flow of wastewater through Blue Plains is 300 mgd, though we have a capacity of 384 mgd  
Avg drinking water pumped: DC Water pumped an average of 101 million gallons of water per day on average in FY 2015.

Population Served:

DC Water provides more than 672,000 residents, 17.8 million annual visitors, and 700,000 people who are employed in the District of Columbia with water and sewer/wastewater treatment.

Blue Plains treats wastewater from jurisdictions in Maryland and Virginia for an additional 1.6 million people.

#### Location

Street Address: Headquarters: 5000 Overlook Avenue, SW		
City: Washington, DC	Zip Code: 20032	
<b>Contact Information</b>		
Name: Pamela Mooring	Phone: 202-538-2773	Email: Pamela.Mooring@dcwater.com

## ORGANIZATIONAL CULTURE

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

### *Performance Measures & Results*

#### **Workforce Development & Safety**

##### **Internship Program-**

DC Water hires between 30 and 60 college interns every summer, providing them with full-time, paid work experience in a number of areas—legal, research, external affairs, accounting, etc. The interns are provided professional development and education programs including resume development and water resources education. The interns also prepare a presentation on their summer experience. In addition, interns in some areas are hired for full-time, year-round work at DC Water.

##### **Partnerships with Universities-**

Through collaboration with regional, national, and international universities, DC Water supports about 20 M.S. and Ph.D. students who are completing their research on DC Water projects. Collaborating universities in recent years have included Virginia Tech, University of Maryland, George Washington University, Howard University, Bucknell University, Columbia University, Ghent University, University of Innsbruck and University of Queensland. Supporting organizations include USDA and the Metropolitan Washington Council of Governments. DC Water also continues a strong collaborative relationship with the Water Environment Research Foundation (WERF).

##### **Training and Development-**

DC Water offers dozens of trainings online through Cornerstone learning and also provides on demand trainings where a need is identified. DC Water formerly offered a literacy program and now is contracting with DCHR (District of Columbia Human resources) to offer “Thriving in the Workplace” to provide basic skills for personnel. Professional development, retirement planning, health (exercise, weight control, diabetes, etc.) and safety seminars (First Aid, CPR, AED, etc) are offered each month. Health screening are offered several times per year and during open enrollment medical insurance providers participate in a Health Fair at each major DC Water location.

## **Risk and Safety-**

Effective risk management begins with any organization's commitment to safety and health. DC Water upholds that commitment for every labor operator and business manager.

DC Water's Risk Management and Safety partnership was established at the beginning of the Authority's existence. The Risk Management Department is responsible for administering all aspects of insurance and risk management. This includes:

- Securing company-wide insurance policies for the Authority's operational and capital construction insurance program (Rolling Owner Controlled Insurance Program – ROCIP)
- Managing insurance claims and loss control
- Maintaining databases of losses/claims, establishing insurance procedures
- Assisting senior management with enterprise risk management

The Department of Occupational Safety & Health strives to reduce or eliminate accidents or injuries through planning, inspection, and education. Current services being provided include:

- 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 reoccurrence

## **Enterprise Culture**

### **Strategic Planning, "Blue Horizon 2020"**

DC Water engages in strategic planning to identify goals, initiatives and milestones and track performance. The Strategic Plans are generally on a five-year cycle and begin with the Board of Directors and Executive Team. Accountability is achieved through Goal and Initiative champions and through the creation of performance metrics. DC Water's current Strategic Plan is named Blue Horizon 2020. The original version is available online, though in the past fiscal year, the team re-evaluated the goals and

## **Finance-**

To provide continuous delivery of water and wastewater services, it is vital that DC water has a consistent revenue stream to cover operating and maintenance (O&M) costs, debt service, and other liquidity requirements. DC Water has a diverse customer base and receives revenues from a variety of sources. Retail rates are charges for water, sewer and other services to DC Water's customers. Wholesale revenues are received from suburban water and sewer authorities for their share of the O&M costs of the Blue Plains Advanced Wastewater Treatment Plant.

Based on the analysis of the peak demand of different customer classes as well as affordability considerations, DC Water has adopted several changes to its existing retail rate structure in FY 2016. These changes are designed to better align the Authority's revenues and expenditures by establishing customer class-based volumetric water rates based upon peaking factors, to create a more progressive rate structure for its residential customers by establishing lifeline water rates, which discount core

consumption and to fund the Authority's water main replacement program by establishing a monthly, fixed Water System Replacement Fee (WSRF). This fee is designed to fund the renewal and replacement of aging water service lines. DC Water has expanded its affordability program for low income customers by providing 100 percent credit for WSRF.

**Multi-Year Rate Proposal:** DC Water is moving to a multi-year rate proposal in FY 2016 covering the period FY 2017 and FY 2018. The projected benefits include (1) greater revenue certainty, (2) increased budget discipline and (3) better alignment between revenues and expenditures.

**The Clean Rivers Impervious Area Charge CRIAC:** is a separate sewer service fee established in FY 2009 to recover the \$2.6 billion cost of implementing the DC Clean Rivers Project (the District's CSO-Long Term Control Program).

**Customer Affordability:** In the District of Columbia, one-fourth of the residents live below the poverty line, thus rate affordability is of utmost concern in the planning process. DC Water seeks to balance its operating and financial needs with consideration to the financial impact upon its customers. DC Water sponsors two programs to assist low income customers in paying their water bills.

### **Capital Improvement-**

DC Water has a ten-year \$3.84 billion Capital Improvement Program (CIP) for its water and sewer facilities infrastructure. The CIP provides a framework for the development, prioritization, implementation and measurement of the capital projects undertaken by DC Water.

Over the last 18 years, \$4.9 billion have been invested on DC Water's system averaging approximately \$274 million per year capital expenditure. The chart below shows historical and projected capital spending.

### **Asset Management-**

DC Water has recently initiated a comprehensive Asset Management Program. The overall goal of the program is to develop and implement work practices and tools that help DC Water minimize life costs of infrastructure assets, at an acceptable level of risk, while delivering established levels of service. The initial phase was completed in 2015 and established the foundation for the program. This included development of an Asset Management Policy, Levels of Service, and an Enterprise Risk Framework as well as establishing a Governance Structure for the program. All of this was documented in a Strategic Asset Management Program.

Current initiatives include: 1) implementation of a business case evaluation process and tool; 2) implementation of a capital project prioritization process; 3) development of Asset Management Plans for each service area; and 4) development and implementation of an extensive asset reliability program for all vertical assets.

### **Innovation-**

DC Water is home to a world-renowned research program. In fact, several engineers hold patents for their work at the Authority and many, such as Walt Bailey and Sudhir Murthy, PhD, have won prestigious and international awards for their research at the Blue Plains Advanced Wastewater Treatment Plant. From using a newly discovered microbe in wastewater treatment to cut chemical and electrical costs, to being the first to bring thermal hydrolysis to the continent, DC Water's teams are encouraged to use innovation for efficiency, environmental benefits and cost savings.

DC Water invites input and ideas from staff at all levels and is initiating a program called the Shared Ideas Program ("SIP") that encourages staff to submit their ideas and then crowdsources those ideas to

determine which to pursue. The goal is to create the platform, test it internally and eventually invite the public to submit their ideas as well.

## **Enterprise Resiliency**

### **Cybersecurity-**

The Authority's CyberSecurity program is based off of the principles outlined in 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"), implementing security controls... and monitor the security controls. We've taken advantage of 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 (NAVV).

### **Emergency Management-**

DC Water has developed a Department of Emergency Management to support the Authority during times of crisis, to prepare and train staff to act in a crisis, to develop policies and procedures, maintain equipment and develop relationships with emergency management, city and regional agencies as well as with other groups with like missions—utilities, Silver Jackets (flood prevention), HSEMA and emergency response personnel. DC Water has trained an Incident Management Team (IMT) and uses the Incident Command System (ICS) to respond to emergencies.

### **Climate change and resiliency—**

DC Water is ahead of many water utilities in studying and planning for natural and man-made disasters from storm flooding to sea rise to water emergency. DC Water hosts a Critical Customer Roundtable each year to share best practices, identify weaknesses and to assist agencies and customers in identifying gaps in their planning. DC Water participates in numerous regional programs for long-range resiliency planning.

## **Community Engagement**

### **DC Water Works – Local Hiring Program**

DC Water launched a program to partner with local businesses to hire more local residents to work on DC Water's projects. In 2015, DC Water operated three satellite Job Centers across the District of Columbia to give potential applicants information on job openings with DC Water contracting firms and to provide assistance with resume writing. In 2015, 39 individuals were hired through the Job Centers. DC Water has learned the available jobs are highly skilled and often don't match the backgrounds of the job seeking population. With this skill gap in mind, DC Water took the extraordinary step of creating a mentorship program where local residents could receive paid entry-level on-the-job training with a local construction firm.

The lessons learned from this pilot program are being applied to a broader local employment strategy -- DC Water is developing a program to incentivize contractors to hire residents of the DC Water service area. The comprehensive program, called DC Water Works, already made an impact in 2015 when 83% of the 137 newly-hired contractor employees lived in DC Water's user jurisdictions.

### **Affordability and Customer Assistance**

DC Water offers two programs to assist eligible customers with paying their water and sewer bills if they are experiencing a financial hardship. **Serving People by Lending A Supporting Hand (SPLASH)** is a DC

Water program that assists families and individuals facing hardships in maintaining critical water and sewer service. The program is funded in its entirety by contributions from customers, the community and DC Water employees. The Greater Washington Urban League administers the program in which all contributions are distributed to customers in need. In FY15, DC Water received contributions totaling \$116,000 which was distributed to over 350 customers.

DC Water also assists customers through the Customer Assistance Program (CAP) which is administered by the District of Columbia's Department of Energy and Environment Office (DOEE). This program offers a discount of up to 400 cubic feet (4 CCF) of water and sewer services per month. This discount can save an eligible customer over \$400 annually. DC Water CAP customers received discounts of over \$1.2 million in FY15.

### **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 its customers and introducing DC Water's innovations world-wide. From front-page stories in the *Washington Post* to international broadcast media, DC Water's media relations has touched millions.

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes

Currently evaluating and looking to pilot a sewer heat recovery system in DC. Working with DCPS to find an appropriate school to pilot this use.

Evaluating solar panels for our WWTP, over roofs, parking lots, and sedimentation basins. Initial evaluation shows we could produce >10MW of power from this source (during daylight hours).

Currently evaluating co-digestion of food. DC Water has excess capacity in the digesters, and is building an economic model to show costs and benefits. Could potentially generate another 1-2 MW.

#### *Performance Measures & Results*

- Reduced reliance on grid power - Averaging about a 30% reduction in grid draw, from 30MW to 20MW
- Carbon footprint reduction - 8000 MT CO<sub>2</sub>e reduction each month. In February, 2015 we saw reductions from reduced biosolids hauling due to digestion. In June 2015, our CHP system started up and we saw additional reduction in the carbon footprint.



- Percentage of power use from renewable sources - 30%
- Renewable Energy Credit Generation - ~87,600 MWhr of Tier 1 REC's generated annually.

## ***Downers Grove Sanitary District IL***



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### **Downers Grove Sanitary District IL**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Watershed Stewardship**

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Separate Sanitary Collection System with Remote Lift Stations and Wastewater Treatment Plant		
Service Area (square miles): 20	Average annual daily flow (MGD): 11	
Population Served: 62,000		
Location		
Street Address: 2710 Curtiss Street		
City: Downers Grove State: Illinois	Zip Code: 60515	
Contact Information		
Name: Nick Menninga	Phone: 630 969 0664	Email: nmenninga@dgsd.org

**NARRATIVE:** The Downers Grove Sanitary District embodies all elements of the Utility of the Future model. While the organization is relatively small, it is configured with personnel focused on continually improving resource recovery opportunities, water resource sustainability, and visibility as a leader in the community in these areas.

Three (of the numerous potential) areas for consideration are:

- Ongoing progress towards becoming a ‘net zero’ energy treatment facility,
- Leadership role in the local watershed restoration workgroup,
- Community outreach and communications.

The staff of about 35 is organized into a flat structure with a manager reporting to the Board of Trustees, six supervisors, and the remainder hourly workers with responsibility and authority to carry out the goals and vision of the organization. The foundational vision areas are customer service, environmental protection, cost-effectiveness, and transparency. All levels of the organization are engaged in the planning, implementation, monitoring and assessment, and identification of further improvement opportunities. This system of Plan, Do, Check, Act puts the organization on a continuum of cost-effective, manageable change that shifts the organization’s focus from waste disposal to a value-added community resource.

All levels of the organization function to some extent on a professional level, with an ever-expanding foundation of knowledge and skills through training and involvement with professional associations coupled with rigorous ethical and moral performance expectations. The advantage of the small, flat structure is the ready communication and resulting relationship-building that promotes clear understanding among staff of high-level goals and policies, as well as the detailed implications of every decision and change, however minor.

#### Energy Sustainability

About 10 years ago, amid spiraling energy costs and the emergence of more modern water-efficiency technologies, attention was turned to controlling the 15% bite that energy was taking from the annual operating budget. Various in-plant energy infrastructure arrangements were evaluated, with electricity emerging as the preferred medium, with most existing processes being motor-driven.

Following a complete energy audit, efficiency improvements were systematically identified and implemented, from lighting and HVAC, to pump variable speed controls and a complete re-design of the plant’s activated sludge aeration system. Over a period of about 5 years, plant energy use was reduced

by about 1/3. Efficiency efforts continue, with full-scale testing planned to implement a BNR configuration with potential to further reduce process energy demands.

Energy generation is the next way to move towards energy sustainability. Biogas has traditionally been used to provide process heat for the digestion process, with excess gas simply flared off as a waste. The first step in optimizing this resource was to begin receiving compatible high-strength waste and co-digesting it with sewage sludge to boost gas production. Higher volumes of gas created better opportunities for more efficient larger CHP technologies that generate electricity and process heat for the anaerobic digesters. A CHP facility has since been installed at the plant, including gas cleaning equipment and an engine-driven generator with engine cooling system heat recovery used to heat the anaerobic digesters. With this installation, 70% of the existing energy used at the plant comes from biogas. A second CHP unit is currently under design, with the goal of operating with no utility electricity during normal flow periods. Other potential future projects include upgrading emergency backup generation with improved air emissions equipment, in order to meet wet weather energy demands.

#### Watershed Stewardship

The regulatory environment made a dramatic change about 15 years ago, when the TMDL program began replacing the historic use of technology-based effluent standards that had dictated POTW discharge limitations. The badly underfunded and data-deficient program attempting to identify appropriate pollutant load allocations for the receiving stream watershed was fortunately designed to engage watershed stakeholders, who joined in a consortium to implement an adaptive management program to meet the stream use goals identified in the law.

The District played a key role in identifying this need, and became a founding member of the DuPage River Salt Creek Work Group (DRSCW), with staff involvement on the executive level of the work group since its inception. The District currently keeps a part time position dedicated primarily for coordinating DRSCW activities. The DRSCW's membership consists of POTW and MS4 owners as the core and principal funding source, with associate membership from activist groups, consultants, and other interested stakeholders. The geographic area includes a roughly 360 square mile drainage area of urbanized headwater streams that are part of the Mississippi River Drainage Basin, 19 major POTW owners and 57 MS4 owners. Stream uses of concern include aquatic life, primary contact, and aesthetic quality.

The DRSCW conducts the key steps in adaptive management, including comprehensive routine monitoring and assessment, identification of stressors causing non-attainment, development and prioritization of restoration projects and activities with the best opportunities for moving towards stream use goals, and continuous evaluation of project and program effectiveness with monitoring results.

The DRSCW has been successful in developing a \$10 million stream restoration funding program for its POTW members that is incorporated into the NPDES permits of its POTW members. In exchange for extended compliance schedules for accepting phosphorus limits needed to meet the State's strategy to address nutrient losses to the MARB, POTWs will pool a significant portion of the delayed P-removal operating costs to address higher-priority stressors affecting the local watershed. Project commitments include dam removal and habitat restoration projects that are expected to 'move the needle' towards meeting aquatic life goals in the watershed, as has been demonstrated with similar recent projects.

## Outreach and Communications

Full engagement at the state-wide, professional peer, watershed, and local village scales are all integrated into the routine activities of the organization, providing engagement and leadership at multiple community levels. District outreach and communications range from international technology exchanges to scout troop plant tours complete with merit badge awards.

For over 25 years, the District has held an annual open house at the wastewater treatment center, an opportunity to demonstrate the scope and value of the wastewater utility that our customers own. It is a great opportunity for elected officials to meet people, high school science students seeking extra credit, boy and girl scouts to get merit badges, interested general public to learn more about their community, and District staff to show off their pride and joy. Local outreach has expanded into a comprehensive annual newsletter, a user-friendly web site, and a social media presence, with part time staff dedicated to these sorts of local public communications. Recent outreach with the local grade and high-school districts has opened up opportunities to incorporate hands-on experiences for students as part of the STEM curricula at local schools.

In addition to extensive watershed stewardship, the District is fully integrated into local permitting and planning as it relates to water resources. The District served as a stakeholder in the development of the local stormwater utility, and coordinates planning, permitting and construction activities with the local water supply and stormwater authorities. The District's Board President serves on the wastewater committee of the local regional planning agency, the Chicago Metropolitan Agency for Planning.

District staff are well known participants in various local professional associations. We have committee and executive leaders at the Illinois Association of Wastewater Agencies and at Central States Water Environment Association. The District is recognized as a source of a variety of high quality technical presentations for numerous venues with a wide variety of interests. One result of this involvement is being identified as a valued stakeholder in state-wide initiatives, including the Illinois Nutrient Loss Reduction Strategy, as well as the development of energy efficiency grant programs administered by the State of Illinois Department of Commerce and Economic Opportunity, and the Illinois Clean Energy Community Foundation.

The District's partnership with the Danish Consulate's Water Technology Alliance has helped the District broaden its knowledge of available technologies, including energy production equipment and process changes for lower energy use. Hosting a WTA workshop created a good opportunity to generate interest in energy issues among peer agencies in the local vicinity.

## Application Part 3: Utility of the Future Today Activity Areas

### Requirements

Each applicant is required to submit responses for the Organizational Culture Activity Area, and at least one additional Activity Area of their choosing.

Applicants may submit responses for as many Activity Areas as they choose beyond the minimum requirement. There is no "penalty" for submitting responses for only two Activity Areas – each activity area will be assessed independently of all others.

### Instructions

For each Activity Area that an applicant chooses to submit responses, applicants are asked to demonstrate robust engagement in that Activity Area.

Activities: Example activities are provided to which applicants will indicate “yes” or “no” for whether or not they are engaged in these example activities. Additional space is provided for applicants to list additional or alternative activities which they are engaged in relative to the Activity Area, and which they believe demonstrate or further demonstrate robust engagement in the Activity Area.

Performance Measures & Results: For each Activity Area for which responses are submitted, applicants are asked to list the performance measures which they use to track results in the Activity Area, and to describe their results (quantitative when possible/appropriate) – results can be actual results realized over the past 12 months, or anticipated results for the future as a result of new programs or practices. Example performance measures are provided for each area.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

PDCA management philosophy employed by all levels of staff.

### *Performance Measures & Results*

- Supervisory promotions from within the organization 100% over 5 years
- Optimization of technology performance for efficiency/generation equipment Exceed equipment up-time and delivery goals
- Customer satisfaction survey approval ratings Greater than 95% positive program feedback

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Performance Measures & Results

- Percent of biosolids distributed to public 100%
- Customer satisfaction recipient survey feedback Over 95% positive

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

### *Performance Measures & Results*

- Classroom sessions attended - >20 per year
- Open house attendance - >250
- Facebook 'likes' - >700
- Web site traffic - Varies

## **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

### *Performance Measures & Results*

- % of budget spent on energy <4%
- Percentile ranking on NACWA financial survey, kwh/MGD at WWTP 84

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

*Performance Measures & Results*

- Annual electricity production 1.62 million kwh
- % of energy generated on-site >70%

**INTEGRATED GROWTH PLANNING**

- Use of the Integrated Planning Process to provide the most environmental benefit at the lowest cost to ratepayers
- Climate impact resilience incorporated into planning of new infrastructure
- Evaluation of water quality trading options

*Performance Measures & Results*

- Collection system performance, annual backups and overflows - 0 wet weather backups, one wet weather manhole overflow event
- Annual update of unsewered area plan - Completed for 2016
- Watershed group participation - Integrated planning for watershed improvements, nutrient trading being evaluated by group

**NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Contracts or agreements in place for materials provision

*Performance Measures & Results*

- Metals collection and recycling - Periodic sales of scrap metals
- Cooking oil collection program - Added to digester co-digestion for gas production
- Nutrients captured and delivered in bio-solids - Full re-use of publicly distributed biosolids used as soil supplement/fertilizer
- FOG waste receiving station - Conversion of waste to useful biogas, minimize haul distances for collection contractors

**WATERSHED STEWARDSHIP**

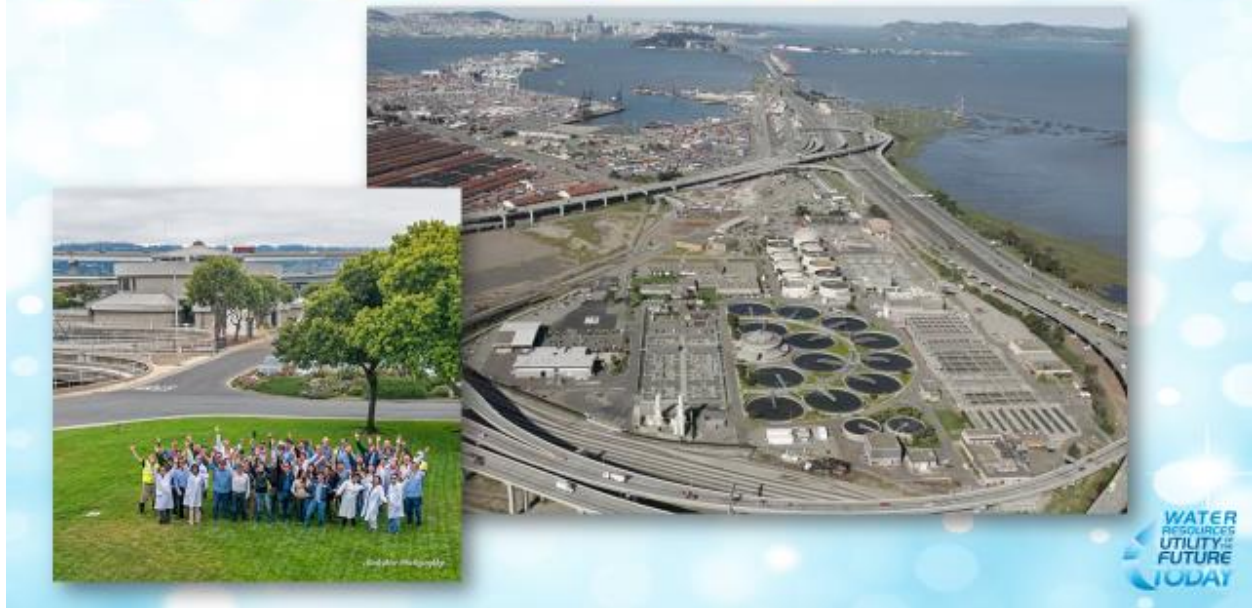


- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

*Performance Measures & Results*

- Improved macro-invertebrate and fish indexes of biotic integrity - Scores recorded on 3-year cycle
- Reductions in road salt use - Usage surveys and water quality data collected annually
- Area-wide NPDES permit provisions for habitat restoration projects - Projects and activities with specific goals identified in NPDES permits

## ***East Bay Municipal Utilities District CA***



### **East Bay Municipal Utilities District CA**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**

<b>Utility Description (combine all plants if a multi-site system)</b>		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): <b>Multiple plants</b>		
Service Area (square miles): <b>88</b>	Average annual daily flow (MGD): <b>53 MGD</b>	
Population Served: <b>650,000</b>		
<b>Location</b>		
Street Address: <b>East Bay Municipal Utility District, Main Wastewater Treatment Plant, 2020 Wake Ave.</b>		
City: <b>Oakland</b>	State: <b>CA</b>	Zip Code: <b>94607</b>
<b>Contact Information</b>		
Name: <b>John Hake</b>	Phone: <b>510.287.1542</b>	Email: <b>john.hake@ebmud.com</b>

**NARRATIVE:** Like many utilities, the East Bay Municipal Utility District (EBMUD) currently finds itself in the midst of a collapsing retirement bubble and the associated challenges of attracting and integrating a large number of new employees to lead the organization into the future. EBMUD turned this challenge into an opportunity to reflect, define and focus its core values and cement a positive improvement-oriented culture. Management formed a “Values Team” with representatives from throughout the organization to solicit input on core values and areas for improvement. Out of this process, EBMUD established four core values: stewardship, integrity, respect, and teamwork. Additional efforts are currently underway to define how these values can be better supported through organizational improvements and enhanced communication. The development of these core values and the dialogue around them is an excellent example of employee engagement, leadership, and goal-setting at EBMUD; other examples include:

- Development of a Strategic Plan that outlines key organizational goals and objectives shared throughout the organization. Progress toward meeting milestones and goals are monitored through key performance indicators and shared.
- Structured internal leadership training programs that prepare staff in various career tracks to assume supervisory and management positions in the future.
- A commitment to workplace safety with a lost time injury rate that is less than the industry standard. EBMUD received a CalStar award in 2002 for excellence in safety practices.
- Outstanding permit compliance as evidenced by EBMUD receiving zero NPDES permit violations at its Main Wastewater Treatment Plant in the last 16 years—an accomplishment that was recognized by NACWA in awarding EBMUD a NACWA Platinum Award this year. This is a direct result of a goal jointly set by management and staff to achieve the platinum award and is consistent with the core values, especially environmental stewardship.

EBMUD’s organizational culture and commitment to environmental stewardship is evidenced in its Biosolids Management Program (BMP). EBMUD’s BMP was established over ten years ago and is based on an environmental management system (EMS) that promotes continuous improvement, communications with internal and external stakeholders, regulatory compliance, and biosolids quality. EBMUD maintains a “platinum-program” certification level from the National Biosolids Partnership (NBP). In addition, EBMUD staff is active in leadership positions on biosolids committees at the national, state, and local levels within the wastewater industry. This participation ensures that staff maintains awareness of the regulatory changes, innovative technologies, and the success and concerns of other

agencies. EBMUD established a Board-level policy to promote the beneficial use of biosolids and consistent with that policy, EBMUD beneficially reuses 100 percent of its biosolids.

EBMUD is actively engaged with the communities it serves through tour programs, social media, and industry liaison groups. While EBMUD has provided facility tours for many years, the organization has recently expanded and formalized the program to make tours available to the general public and school groups. Tours for school groups foster environmental awareness in younger students and provide more advanced technical information for college and graduate students. Pollution prevention programs to build community awareness about disposal of fats, oils, and greases, household cleaning products, and pharmaceuticals, are key to EBMUD's mission to prevent these problematic pollutants from clogging wastewater infrastructure or reaching receiving waters. EBMUD is engaged with its immediate neighbors through a neighborhood liaison group that exists to receive input on matters of immediate concern, including odors. Neighbors can contact EBMUD through an odor hotline at any hour to report problems, which result in real-time investigation and response.

EBMUD has the unique distinction in the areas of energy efficiency and generation as the first wastewater treatment facility in North America to become a net energy producer in 2012. This achievement was a result of an innovative and expansive resource recovery program to generate more onsite electricity than is typical for a plant of its size, as well as from concerted efforts to reduce plant energy demand. Since 2002, EBMUD has grown a world-renowned resource recovery program that includes capital improvements for receiving and feeding the anaerobic digesters, an organizational structure with established acceptance criteria to protect the treatment process, and research and testing to continue to innovate and expand into new areas. The growth of this program has more than doubled EBMUD's biogas production and onsite electrical generation. When combined with a strong energy efficiency program, this results in net energy production of 138% of its electricity needs. The surplus renewable energy is sold to a neighboring municipal utility, generating revenue that helps EBMUD to maintain reasonable wastewater rates for all ratepayers. To build the resource recovery and energy efficiency programs, EBMUD conducted a number of studies including an Energy System Master Plan and a Waste-to-Energy Study. EBMUD includes energy-efficiency projects in its Strategic Plan and established Board-level Sustainability and Energy policies, which demonstrate its commitment to energy conservation, renewable energy generation, and enhanced performance and reliability.

Currently, EBMUD recycles nutrients through land application of its biosolids, but is seeking to expand these efforts by diverting a greater portion of biosolids to agricultural uses or recovering nutrients in the liquid stream. In parallel, EBMUD is very active in furthering the understanding of, and addressing issues related to nutrient levels in the greater San Francisco Bay region. EBMUD is leading a multi-agency effort to assess measures to reduce nutrient discharge to San Francisco Bay based on sound science. This effort includes an engineering evaluation of alternative nutrient recovery/removal methods and piloting innovative methods for sidestream treatment. In addition, EBMUD is initiating efforts to prepare a nutrient recovery master plan for its entire facility. In addition to nutrient control and recovery activities, EBMUD has a comprehensive recycling program in place for a variety of materials, including metals, paper, green waste, and electronics.

As a combined water and wastewater agency, EBMUD is committed to using its wastewater resources to augment limited potable water supplies and this is formalized in its water supply plan. EBMUD currently recycles approximately 9 million gallons per day (mgd) of wastewater for landscape irrigation and

industrial uses and plans to increase this flow to 20 mgd by the year 2040. EBMUD supplies its largest water customer, an oil refinery, with 8 mgd of recycled water for its operations, including a high-purity water supply for boiler feed. To provide the high-purity water, EBMUD operates an integrated membrane facility on the refinery site. Concentrated industrial reuse for a single large customer is a cost-effective form of water reuse, which saves on piping and distribution costs. EBMUD is also coordinating with local building developers to install separate piping for recycled water that can be used for toilet flushing.

Pollution prevention programs are another strategy EBMUD utilizes to protect its watershed. EBMUD's Commercial and Residential Pollution Prevention Programs help protect the health of San Francisco Bay by combining education, public outreach, and permit requirements to reduce the discharge of pollutants like metals and organics in the wastewater. EBMUD is one of the first utilities to sponsor a pharmaceutical take-back program to reduce pill and medicine disposal via toilet flushing. It is estimated that this take-back program has kept more than 10 tons of drugs from reaching San Francisco Bay.

EBMUD is actively engaged on numerous environmental fronts to practice one of its core values: stewardship. Environmental stewardship takes many forms at EBMUD including attempts to close the materials loop to ensure that resources embedded in the water that arrives at its wastewater facilities (whether they are in the form of water, energy, or nutrients) are extracted and reused to the maximum extent practicable. It also takes the form of pollution prevention, to ensure the most problematic pollutants are kept out of the wastewater system and never reach San Francisco Bay. As careful stewards, EBMUD consistently communicates with its internal and external stakeholders to educate, inform, and receive feedback so that the agency and its customers together can maximize resource recovery and minimize environmental impacts.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed
  - Drives an awareness and commitment to workplace safety.
  - Establishes periodic tracking of progress toward meeting goals and milestones.
  - Provides opportunities for employees to find and fix inefficiencies, share ideas for solutions to problems.
  - Implements internal leadership training programs.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Establishes KPIs in Strategic Plan which is reviewed and updated bi-annually.	First strategic plan established in 2004; recently updated in May 2016.
Rolling 12-month average lost time injury rate.	Less than 2 per 100 employees (Industry standard is 5.5 per 100 employees)
Employee engagement in sharing ideas for future of organization	Developed team of over 60 individuals from throughout the organization, both horizontal and vertical cross sections empowered to develop values statements for the organization and identify recommendations for improving long-standing organizational issues (FY15-FY16). Work continues (FY16-FY17) on these initiatives with five additional teams charged with identifying the means to embed the values and make further progress on several of the recommendations for organizational improvement.
EMS based Biosolids Management Program that reinforces continuous improvement philosophy.	Certified in 2006 and maintained certification since then
District-led leadership training academies.	Number of cohorts: 13; Number of participants (total): 203

**BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use
  - EBMUD staff serve in leadership positions on local, state, and national biosolids committees (Bay Area Clean Water Agencies Biosolids Committee Chair, California Association of Sanitation Agencies Land Committee CoChair, and National Biosolids Partnership Advisory Committee Chair). Participation and leadership on these committees allows the District to provide input and stay up-to-date on biosolids regulatory issues and emerging technologies.
  - A Biosolids Master Plan update is underway to research additional end uses and long-term, sustainable alternatives for the District’s biosolids.
  - To allow for diversification and future research, the request for proposals for the upcoming biosolids handling contract will specify that 10% of the biosolids tonnage may be reserved for pilot projects.

*Performance Measures & Results*

- Amount of biosolids beneficially reused each year - 100% as either alternative daily cover or land applied

- Increase in amount of biosolids sent to land application - Increased from 25% of annual tonnage in 2008 to 43% in 2015.
- Number of years as a certified National Biosolids Partnership agency - 10 years Increase in average cake dryness (reduction in amount to be hauled away)
- Increased from 21% total solids in 2007 to 25% total solids in 2015

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

A new public tour program was established for the MWWTP in 2016 for residents and schools. A webpage was established to make it easy for the public to make reservations online. Tours are led by employees and retirees.

The District set up nine locations within the service area where residents can dispose of unwanted and expired medicines. The locations are listed on the District's website and mentioned at community events.

Staff actively does public outreach with businesses and residents to reduce the disposal of fats, oils and grease in the sewer system and pollution prevention. The District also does joint outreach with other agencies on pollution prevention. Information is available via the District website, printed outreach materials, billboards, and a hotline number.

In the mid-1990s, the District formed the West Oakland Liaison Group to provide a forum for District staff and local community members to discuss current and upcoming projects and activities and for the District to receive feedback from the community on any specific concerns. REFER TO APPENDIX 1 FOR

### *Performance Measures & Results*

- Number of website hits
  - Average of 4,000 hits/month for the main EBMUD Wastewater website in the past year
  - 507 hits on the Wastewater Treatment Plant Tour webpage since launching in March 2016
- Number of people who have attended the new wastewater treatment plant tour: 100 people (between new program launch in April 2016 and June 2016)
- Number of gallons of residential cooking oil collected: 3,211 gallons collected from three locations in the service area in 2015

- Number of pounds of unwanted/expired pharmaceuticals collected: 4,700 pounds collected in 2015 (over 20,000 pounds since the program began in 2009) Number of community events attended Five in 2015
- Number of hotline inquiries: 151 in 2015

## **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

The District’s Strategic Plan includes a principle to conserve energy. There is a specific objective that states “Identify and implement energy efficiency projects.”

An Energy System Master Plan for the MWWTP was completed in 2012.

There is sub-metering for critical processes, which will be enhanced through additional sub-metering.

Anaerobic selectors were added, which significantly reduced the amount of horsepower required for each reactor train in the secondary treatment process.

The oxygen compressors were optimized to only produce the amount of oxygen required for the MWWTP. Reducing the amount of oxygen produced saved energy while not affecting the overall treatment process.

### *Performance Measures & Results*

- Participation in research activities: Participated in the WERF WaterWatts Energy Research project.
- Key Performance Indicator in Strategic Plan: Reduce indirect greenhouse gas emissions to zero by 2040 and direct emissions by 50% by 2040 compared to the 2000 baseline
- Energy intensity: 2,220 kwh/MG

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)



- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Formal Resource Recovery (R2) program in place to evaluate and accept organics.

Receiving stations for accepting high-strength organic wastes by truck, fed to digesters.

In addition to liquid wastes, have capability to accept solid food waste for digestion.

Board of Directors includes Sustainability/Energy Committee.

EBMUD Strategic Plan includes goals for renewable energy generation.

#### *Performance Measures & Results*

- Renewable energy generation: Generate 138% of WRRF demand, export surplus
- Annual energy savings: On-site generation saves \$2.8M annually
- Annual energy revenue: Surplus exports earn \$1M annually
- Evaluation of generation options: Evaluations conducted in 2005, 2009, 2012, 2016
- Solar power generation: Approximately 1.2 MW of PV at District facilities

### **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities

Recover nitrogen and phosphorus through land application of biosolids generated.

Completed engineering evaluation of recovering nutrients (as fertilizer) from dewatering centrate (sidestream), using innovative technologies such as: Ostara, Airprex™, and ammonia stripping.

Leading a regional study to pilot testing new cost-effective and environmentally-sustainable sidestream nutrient removal and recovery technologies, including anammox processes and Coupled Aerobic-anoxic Nitrous Decomposition Operation (CANDO).

Initiating a master plan for nutrient removal and recovery for the entire plant.

Comprehensive materials recycling program including paper, metals, pallets, green waste, and *electronics*.

#### *Performance Measures & Results*

- Assess type and percent of nutrients recoverable versus available: Conducting nutrient sampling and quantifying recoverable nutrients

- Conduct cost and benefit analyses of various nutrient recovery technologies: Completing high-level cost and benefit analyses of viable technologies for nutrient recovery from nutrient-rich sidestream
- Conduct pilot testing for promising technologies: Completing pilot testing of various anammox-type and CANDO technologies through collaboration with other WWTPs in the region
- Further assess potential market and venue for wastewater-derived fertilizer products: Will prepare Market Study Report

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

Reuse off-site for irrigation, construction, industrial cooling, and toilet flushing.

In-house quality testing and annual publication of recycled water quality information.

Specialized reverse osmosis treatment for one industrial (up to 3.5 MGD) application.

Ongoing study of recycled water corrosion impacts in cooling systems.

### *Performance Measures & Results*

- Offset East Bay's potable demand with recycling (20 MGD by 2040)
  - o Constructed infrastructure capable of delivering 9 MGD of recycled water
  - o Planned construction of new pumping station and pilot satellite recycling plant (additional 2-3 MGD of RW)
- Environmental benefits
  - o Reduced treated wastewater discharges to San Francisco Bay
  - o Helped maintain sensitive urban green space during the drought

## **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

EBMUD Pollution Prevention programs help businesses, industries and residents reduce the discharge of pollutants to the community sewer and ultimately to San Francisco Bay.

EBMUD Pharmaceutical Take-Back program send a clear message that pharmaceutical drugs should not be flushed into the sewer because of their harmful effects on aquatic life.

*Performance Measures & Results*

- EBMUD WWTP monitors the influent and effluent wastewater to measure the effectiveness of our Pollution Prevention programs.
  - Since the inception of our Pollution Prevention programs Heavy Metals loading has decreased by 95%.
  - Our Pharmaceutical Take-Back program kept more than 10 tons of drugs from reaching the bay.

## Fairfax County VA



### Fairfax County VA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Community Partnering & Engagement



Water Reuse

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Fairfax County Wastewater Management Program. This program includes the water collection and transmission system for Fairfax County, the Noman M Cole Jr. Pollution Control Plant in Lorton, VA, and wastewater planning and monitoring activities, including agreements with other local utilities and an industrial discharger program.		
Service Area (square miles): 234	Average annual daily flow (MGD): 98	
Population Served: 933,000		
Location		
Street Address: 12000 Government Center Parkway		
City: Fairfax	State: VA	Zip Code: 22035
Contact Information		
Name: Sarah Motsch	Phone: 571-242-4709	Email: sarah.motsch@fairfaxcounty.gov

**NARRATIVE:** As evidenced by 18 years of NACWA platinum peak performance awards and triple AAA bond ratings by all three major financial rating agencies, The Fairfax County Wastewater Management Program (WMP) has long been recognized for being a well-managed and complaint wastewater utility. Over the past decade, the WMP has been leveraging this foundation of regulatory excellence and sound financial management to transform itself into a sustainably based service provider in their community.

#### A Culture of Sustainability and Engagement

The nexus of the Fairfax County WMP culture is its Business Team, which defines the strategic objectives of the program, supports all aspects of the program, and models a culture of engagement and sustainability. Team composition aims to bring together leaders, forward thinkers, and perspectives from all levels and functional areas of the entire program. In addition, several business team members serve on the boards of other local utilities, allowing them to integrate those perspectives into the program.

Recognizing that its employees are the center of the culture, the Fairfax County WMP has actively invested in its employees by offering structured training in technical, managerial, and supervisory areas; creating and encouraging opportunities for groups and individuals to independently pursue the strategic goals of the organization; and providing “stretch” opportunities where employees can test and develop their skills. As a result of this investment, over a third of plant positions filled in 2015 were internal promotions. In 2016, the Fairfax County WMP wastewater treatment facility is on track to fill 50% of its positions with internal candidates.

To create and maintain the culture of sustainability, the Fairfax County WMP has invested in several activities to assess itself, set goals for the future, and move towards those goals. These activities have included benchmarking with other utilities and agencies, establishing resource consumption and greenhouse gas inventories, and supporting Fairfax County in working toward achieving environmental goals such as the Cool Counties Initiative, which calls for an 80% reduction in carbon emissions by 2050. An early example of success from these activities is the installation of a line that allowed the program to utilize “trash gas” from a nearby landfill in the wastewater treatment facility’s biosolids stabilization process. This project provide financial benefit, it created a partnership with the community, and reduced the facility’s greenhouse emissions by 60%

Demonstrating the integration of the culture of engagement and sustainability is the Fairfax County’s WMP Environmental Management System which has been certified as an Extraordinary Environmental Enterprise by the Virginia Department of Environmental Quality. Lead by a non-managerial team, the EMS program has supported the Fairfax County WMP in achieving many of its environmental and sustainability objectives. This team and its program continue to actively support the Fairfax County WMP.

In addition to the official outreach program described below, the Fairfax County WMP has also dedicated time and resources to engage the community and ensure the program understands the community’s concerns and needs. Manifested as meetings and interactions with civic groups, members of the Board of Supervisors, and individual citizens, the return on this investment ensures that the Fairfax County WMP stays integrated with the community and understands its needs.

A facet of sustainability is the interconnectedness of everything within a system. While this adds a level of complexity to addressing problems, it also means that every problem offers a multitude of opportunities to use this inter-connectedness to amplify efforts and results. When improving its resiliency against the impacts of climate change, the Fairfax County WMP took advantage of these amplification opportunities to address more than one area. Recently, a new back-up generator system was installed to strengthen the wastewater treatment facility's electrical resiliency. The new generators meet the Environmental Protection Agency (EPA) Tier 4 air emissions, which are more stringent than the facility's air permit requires but will result in less NOx emissions. Another example is measures taken to minimize the likelihood and impact of flooding of the facility by a nearby creek. The Fairfax County WMP was able to team up with Stormwater Management Division to not only address the flooding concerns. The partnership not only provided a more sustainable solution, but also strengthened a relationship for when the next opportunity comes along.

### Community Partnership and Engagement

To ensure it maintains the balance of sustainability and to develop opportunities for it, the Fairfax County WMP has established a strong community presence by developing strong partnerships with the regional school system, nearby utilities, governments at the local, state, and federal level, local universities, community groups, and other partners in the world of sustainability and water. Highlights of this include the participation in the Metropolitan Washington Council of Governments regional marketing campaigns addressing the disposal of grease and medications; a decades long partnership with George Mason University to monitor and document the restoration of the health of the Pohick Creek and Gunston Cove (tributaries to the Chesapeake Bay); and participation in the Chesapeake Bay Foundation's Grasses of the Masses program.

At a local level, the Fairfax County WMP has established partnerships with local civic groups to help them address community issues. Efforts have included establishing a local baseball park, providing land for a trail that is part of the National Park Service's Potomac Heritage Trail, sponsoring a little league team, helping with science fair projects, and participating in stream cleanups and environmental fairs.

Of particular importance is the Fairfax County WMP's partnership with the local school system. Building upon a well-established Sewer Science program that has touched over 17,000 high school students, the program is being expanded into the middle and elementary school programs. Coming full circle from this partnership, the Fairfax County WMP has been able to provide temporary "trial" positions to a few high school graduates that provides an opportunity for them to establish skills and experience to allow them to compete for permanent positions within the Fairfax County WMP. The success of this test program has result in more serious and robust discussions about establishing a larger, and perhaps, wider program that would include other Fairfax County agencies.

### Water Reuse

A highly visible sustainability contribution of the Fairfax County WMP has been the establishment of one of Virginia's first direct non potable water reuse systems. Originally conceived as part of the program to comply with nutrient removal regulations, this reuse water system used alternative design-build procurement to leverage funding opportunities and used established partnerships with the county Park Authority and Solid Waste agency to acquire easement in order to provide reclaimed water to a golf course, ball fields and a cooling tower. This reuse water system provides over 400 million gallons of

reclaimed water each year. Fairfax County WMP has studied the expansion of its distribution and customer base to better serve the community.

#### The Future is Now

As it looks towards the future, the Fairfax County WMP is pursuing an energy recovery and reduction program, staying engaged with the leaders in the water community, and investing in infrastructure in ways that are sustainable and position the utility to take advantage of technological advancements in resource recovery. Officially outlined in the program's strategic initiatives, these goals are already beginning to take substance.

Within the capital improvement program, a major project is under design that would recapture energy associated with the heat from the facility's existing biosolid thermal combustion stabilization process. The project has the potential to recapture up to one fourth of the treatment facility's power use. In addition, the Fairfax County WMP has an Institute for Sustainable Infrastructure certified Envision Sustainability Professional and is assessing the applications of the Envision program for guiding and improving the sustainability of program's capital infrastructure projects. In May, the Fairfax County WMP held a Technical Advisory Group that included world renown professionals who provide guidance and insight into how the program could position itself from an infrastructure perspective to take advantage opportunities in the future, especially in the areas of resource and nutrient recovery, climate sustainability, and watershed stewardship.

The Fairfax County WMP is continuing to maintain its presence in the water industries world through formal and informal partnerships with local utilities and national groups. To stay tied with other local wastewater utilities, several Fairfax County WMP employees continue to serve as members of the Boards for those utilities. In addition, less formal collaboration and partnering occur through professional exchanges such as providing professional and technical support on each other's initiatives, touring each other's facilities and sharing best practices. The Fairfax County WMP also attends and supports relevant conferences, professional meetings and sessions, and participates in WERF's LIFT program.

Through these activities, the Fairfax County WMP continues on its journey to become a Utility of the Future.

#### **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model

- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Fairfax County's Wastewater Management Program formed its "Core Team" in 2000 as result of participating in AwwaRF's QualServe improvement program for water & wastewater utilities. This senior leadership has representatives from all the program's functional areas and formulates the program's strategic plan.

Fairfax County's Wastewater Management Program participates in the Virginia Environmental Excellence Program at the Extraordinary Environmental Enterprise (E4) level. E4 level is for facilities with both fully-implemented environmental management systems (EMSs) (verified by a third party) that have committed to measures for continuous and sustainable environmental progress and community involvement. Fairfax County's program is one of only 3 wastewater facilities in the state.

At the wastewater treatment plant, outside mediators facilitated 7 meetings with the goal of "Constructing a Collaborative Workplace" with over 100 people participating. Participants proposed follow-up actions in the categories of collaboration, training, and flow of information. These actions have included stepped up safety toolbox meetings, monthly social events, more training & development offerings, and changes in communications.

#### *Performance Measures & Results*

- Safety Training Sessions Offered: 190 sessions in FY 2015
- Training Hours per Employee: 30 hours per employee in CY 2015
- Percentage of Positions Filled with Internal Candidates: 32% in FY 2015

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Fairfax County's Wastewater Management participated in the Chesapeake Bay Foundations "Grasses for the Masses," by growing submerged aquatic grasses from seeds and planting them in the Potomac River.

Fairfax County's Wastewater Management participates the Metropolitan Washington Council of Government's Drinking Water and Wastewater Community Engagement Campaign. The team pools resources to provide consistent regional environmental messaging such as "Do Not Flush".



Fairfax County's Wastewater Management sponsors WEF's Sewer Science, a hands on laboratory in which a wastewater treatment plant is simulated. Over 17, 000 Fairfax County students in 25 high schools have participated in the program, which also promotes watershed stewardship and knowledge of wastewater & stormwater utilities.

The Noman Cole Pollution Control Plant has created a jobs program that provides two entry level positions for non-college track high school graduates. This new hires are provided work and skills training to better position themselves when full time openings are available.

*Performance Measures & Results*

- People taking a plant tour: 260 people YTD in CY 2016 (149 people in CY 2015)
  
- Participation in Community Events: 5 events in CY 2015 (Mt. Vernon Town Hall, Mason Neck State Park's annual Eagle Festival, the Lorton Workhouse Earth Day, Touch a Truck at Chantilly Library and Fort Belvoir Elementary School's Family Day)
- Hits on Regional Messaging Page: 6,000 hits in past 3 months

**WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

The Fairfax County Wastewater Management program has been operating a water reclamation and reuse system since 2012 in compliance with Virginia regulations. The 5 mile distribution piping and a 500,000 gallon storage tank deliver reclaimed water to a cooling tower, golf course, and ball fields.

Three consultant studies have identified future customers and analyzed their economic feasibility.

About 2 million gallons a day of plant water is used on site for scrubber water, chemical makeup, and seal water.

The reclaimed water is tested using on line instrumentation and in house laboratory. "Out of specification" water is diverted back to the plant instead of the distribution system.

*Performance Measures & Results*

- Reclaimed water distributed to the public: 444 million gallons in CY 2015
- System Uptime: 99.98% in CY 2015 (up from 99.29% in 2013)

## ***Fairfield-Suisun Sewer District CA***



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### **Fairfield-Suisun Sewer District CA**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**

<b>Utility Description (combine all plants if a multi-site system)</b>		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Single Plant		
Service Area (square miles): 42	Average annual daily flow (MGD): 13MGD	
Population Served: 136,000		
<b>Location</b>		
Street Address: 1010 Chadbourne Road		
City: Fairfield	State: CA	Zip Code: 94534
<b>Contact Information</b>		
Name: Meg Herston	Phone: 707-428-9109	Email: mherston@fssd.com

**NARRATIVE:** 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. Households, retail businesses, major food and beverage producers, light industries, manufacturers, and vital military operations depend upon our service. 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. More details of the information in this application can be found on our website at <http://www.fssd.com>.

Over several decades, the District has evolved from a technical engineering entity to a valuable resource manager, a partner in local economic development, and an active member of the watershed community. The District has taken numerous actions to shift traditional thinking about the way wastewater utilities are run towards the Utility of the Future (UoTF) model—fostering collective responsibility, supportive partnerships, and shared problem solving. Organizational Culture At the heart of the District’s progress is an organizational culture that embraces positive change, empowering the workforce to imagine, create, test, and implement innovative approaches—from everyday work to extreme challenges. Following the 2008 transition from Contract Operations to Owner Operations, the District designed and implemented an organizational model that builds on the successes of its public sector service and maintains the efficiencies of private-sector operations to deliver high-performing, award-winning service with some of the lowest sewer service rates in the San Francisco Bay Area.

The District is a highly collaborative organization. By fostering a relatively flat organizational structure, minimizing bureaucracy, and promoting employee empowerment, the District achieves a high degree of cooperation and partnership between departments to seek out the best overall solutions to shared challenges. The District’s SuperGroup, a cross-departmental team consisting of both formal and informal leaders, holds monthly alignment meetings to ensure continuous improvement. When questioned at a recent SuperGroup meeting, helpfulness, responsibility, creativity, and flexibility were recurring themes listed as core descriptors of the District workforce. Employees in all departments are encouraged to find and fix inefficiencies.

The District was recognized for this culture by the California Water Environment Association, earning an Engineering Achievement Award in 2014 for its Suisun-Central Pump Station Forcemain Equalization project. This project was built upon a concept from a pump station mechanic. Rather than spend \$18 million to expand an under-capacity pump station and forcemain, the District was able to optimize

existing assets by inter-connecting two adjacent forcemains with lower-cost modifications to increase the capacity of the Suisun Pump Station.

As another example, the District has an informal but highly effective cross-training program, where Operations, Maintenance, and Engineering are encouraged to job shadow each other to improve job understanding and promote continuous improvement for the entire District. In addition to the benefits of job shadowing, two of the District's five engineering project managers have become licensed wastewater treatment plant operators, creating a high performing team that is able to actively collaborate on cross-departmental issues. Staff has implemented numerous expense reduction measures, with the most significant through reduction of staff through work re-design and redistribution to existing staff when a position is vacated. Since 2008, 11 positions have been consolidated, saving about \$1.1M per year while providing meaningful professional development and leadership opportunities to remaining staff.

The District also supports a highly effective safety program, resulting in no lost-time accidents for over 12 consecutive years and savings of approximately \$40,000 in workers' compensation premiums each year. Other Activity Areas In addition to Organizational Culture Activities, the District is engaged in several other UoTF Activity Areas, including beneficial biosolids use, community engagement, energy efficiency, energy recovery, water reuse, and watershed stewardship. 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 Fairfield Organic Materials Recovery Center (OMRC) at the District's treatment plant site. Patterned after successful operations in Canada, the OMRC will be the first facility of its kind in the United States.

The OMRC will process all of the District's annual 13,000 wet tons of Class B biosolids plus capacity for another 137,000 wet tons annually from agencies in the San Francisco Bay Area. The new OMRC is under construction with startup anticipated in summer 2016.

The OMRC will transform biosolids into multiple marketable products including a Class A nutrient-rich liquid fertilizer called LystaGro, a recycle product to enhance digestion called LystaMize, and a carbon supply product for Biological Nutrient Removal called LystaCarb.

In addition to providing long-term biosolids management and marketable products, the OMRC will reduce the impact of nutrients in the dewatering sidestream and ultimately eliminate the District need to dewater digested solids. The facility is also being developed to process other organics into marketable products that are currently being landfilled.

#### Community Engagement

The District partners with other agencies on classroom outreach in order to minimize duplication and provide the widest reach. Solano County Water Agency, Solano County Department of Resource Management, and the Fairfield-Suisun Sewer District fund the Solano Resource Conservation District's Suisun Marsh Watershed & Wetland Education Program. This hands-on, field trip based program helps children learn the concept of a watershed and the impacts of humans on their watershed. The District is a member of the School Water Education Program (SWEP) partnership. SWEP's educational programs are multi-disciplinary and aligned with content standards for California schools. The programs encourage students to develop a healthy attitude of personal responsibility towards the environment, and they

help develop skills needed to contribute meaningfully to decision-making on issues involving the community's natural resources.

The District encourages the public to consider the environment in their daily activities through a variety of reoccurring public service announcements on 95.3 KUIIC's regional Hometown Green radio campaign. Partnering with other agencies significantly reduces the cost of airing the segments and allows messages to reach as broad an audience as possible. The segments, which are written by and recorded on-air by staff, include messages regarding the connectedness of streets to local creeks, the importance of recycling, and reducing waste.

#### Energy Efficiency

Energy efficiency is a key driver for every decision made at the District. Treatment plant operators are provided with training on the dynamics of the treatment plant's various power sources, and develop and implement procedures that maximize the use of renewable or off-peak utility power. This has resulted in modifications to the timing and duration of emergency generator testing, cogeneration engine preventative maintenance work, and filter backwashing. Major maintenance projects and new capital projects always consider energy efficiency and overall life-cycle cost rather than capital cost alone. This has resulted in the selection of premium-efficiency motors, LED lighting, and process equipment that operates more efficiently.

#### Energy Recovery

The District strives to obtain as much energy as possible from waste products and renewable energy. Over the past 5 years, the District has produced or acquired more than 67% of its power from 3 renewable sources – cogeneration, solar, and wind. The District's two cogeneration engines combust digester gas (a potent greenhouse gas) to generate more than 40 percent of the annual energy need at the treatment plant. Waste heat is also used to heat the anaerobic digesters. Upon start-up of the OMRC at the plant, a small portion of the final product will be returned to the anaerobic digesters to increase gas production and increase the energy by approximately 25%.

The District has a power purchase agreement for a 1 MW solar farm on the District's property, which generates over 20 percent of the plant's electrical needs in a sustainable manner at a controlled cost. The District's four wind turbines provide 2% of renewable power to the treatment plant.

#### Water Reuse

The District has been producing and distributing recycled water since 1974. Nearly 400 million gallons of treated wastewater is reused each year for crop irrigation and dust control. A majority of plant effluent is supplied to the Suisun Marsh to enhance water quality to sustain this critical part of the San Francisco Bay-Delta estuary ecosystem. The District has received numerous state and national awards for its commitment to innovation and excellence. From a state-of-the art treatment system, to engaging outreach programs, the District has proven the power of a highly qualified, environmentally responsible, and customer-focused team of public employees.

## ORGANIZATIONAL CULTURE

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model

FSSD provides opportunities for employees in all departments to find & fix inefficiencies and we have adopted a continual improvement framework for both capital projects and standard procedures.

The District is committed to financial sustainability – we conduct long range financial planning and we are currently developing a comprehensive asset management plan.

The District fosters cross-functional team-oriented approaches. Highly successful cross departmental team efforts include asset management, permit compliance, contingency planning, and knowledge management.

Staff has implemented numerous expense reduction measures, with the most significant through reduction of staff through work redesign/redistribution when a position is vacated.

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Implemented efficiency project based on employee input</i>	Instead of upgrading the Suisun Pump Station or constructing a new forcemain to increase capacity, the District built upon input from a pump station mechanic and made lower cost modifications to optimize the system and increase capacity.
<i>Staff utilization improvement</i>	Since 2008, 11 positions have been consolidated, saving about \$1.1M per year while offering growth opportunities to remaining employees.
<i>Recognition/awards for financial planning</i>	The Government Financial Officers Association (GFOA) has recognized the District’s Comprehensive Annual Financial Report (CAFR) with a Certificate of Excellence in Financial Reporting for 18 consecutive years.
<i>Employee engagement in UOTF business model</i>	Cross-departmental team initiated to pursue UoTF goals and recognition
<i>Participation in UOTF training</i>	Staff participation in sessions at WEF/AWWA Utility management, NACWA Annual Conference, and WEF Young Professionals Forum
<i>Integrated and coordinated leadership team</i>	SuperGroup, which includes formal and informal agency leadership, from all departments, holds monthly alignment meetings.
<i>Workplace safety measures</i>	12 consecutive years without a lost time accident. Cross-departmental safety committee meets monthly. Safety tailgates incorporated into all department meetings.
<i>Employee recognition</i>	CWEA & CASA awards are celebrated plant-wide.
<i>Asset management</i>	FSSD has over 9,000 assets identified and entered into a Computerized Maintenance Management System. Nearly all of these assets have been rated based on their condition, and many have also been rated based on their consequence of failure. Currently pursuing a risk-based approach to rehabilitation and replacement of assets.
<i>Employee involvement in new processes and designs</i>	Operations, maintenance, and engineering staff work together during planning and design to ensure functionality & efficiency prior to construction.

## BENEFICIAL BIOSOLIDS USE

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

In 2015, the District embarked on a unique partnership with Lystek, 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 in the United States of its kind, transforms non-hazardous organic materials (such as food waste and sewage sludge) into nutrient-rich, federally registered fertilizers and other multi-purpose products. The new OMRC is currently under construction with completion anticipated in 2016.

The District participates in several regional groups focused on exploration/evaluation of alternative biosolids uses, including Bay Area Clean Water Agencies (BACWA) Biosolids committee and the California Association of Sanitation Agencies Biosolids program.

Participation in meetings with other stakeholders, including active participation in the Solano County Biosolids stakeholder group. This group is a public forum to discuss issues related to land application of biosolids.

### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Stakeholder outreach</i>	Since initiating the group more than a decade ago, citizen complaints about land application of biosolids have been reduced significantly. In 2015, only one complaint was received. The stakeholder group was instrumental in developing solutions to public criticism which might have ultimately banned land application in Solano County.
<i>Partnership to develop innovative and sustainable biosolids use</i>	Public-private partnership with Lystek to accept, treat and market FSSD biosolids, as well as biosolids from other plants in the SF Bay region.
<i>Reduction of biosolids generated</i>	FSSD will return Lystek products (derived from biosolids) into digesters to further reduce quantity of biosolids by up to 30%.
<i>Biosolids quality improvement</i>	FSSD is upgrading from Class B biosolids to Class A with the implementation of Lystek process.
<i>Improvement in long-term financial viability of biosolids handling</i>	20-year agreement with Lystek provides cost certainty for solids handling
<i>Beneficial use of biosolids</i>	The District sent 100% of its biosolids to Potrero Hills Landfill for use as alternative daily cover (ADC) in 2015. Upon implementation of Lystek process, biosolids use will move to higher level of beneficial reuse as marketable liquid fertilizer or process enhancements.
<i>Biosolids potentially transformed into liquid fertilizer</i>	The Lystek facility will have the capacity to transform 150,000 tons of biosolids into marketable liquid fertilizers each year.

## COMMUNITY PARTNERING & ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

The District participates in community workforce development programs, including BAYWORK and the Bay Area Consortium for Water/Wastewater Education (BACWWE). These programs offer educational opportunities to support SF Bay Area students who are entering or advancing in the water and wastewater industry.

The District hosted its first treatment plant open house in April 2016, in celebration of the District's 65th anniversary. The free event, which was open to all-ages, allowed members of the community to learn more about the District in a casual and positive environment. Activities included equipment demos, photo opportunities, plant tours, and scavenger hunts.

The District promotes community awareness of value of water, wastewater, and stormwater through its award winning community outreach program.

The District partners with other agencies on classroom outreach to minimize duplication and provide the widest reach. Activities include hands-on field trip based programs, as well as multi-disciplinary classroom programs that are aligned with content standards for California schools.

District staff actively participates in the City of Fairfield's Development Action Review Team (DART), led by the City's community development division.

The District participates in 95.3 KUIIC's regional Hometown Green radio campaign. Partnering with other agencies significantly reduces the cost of airing the segments and allows messages to reach a broader audience. The segments, which are written by and recorded on-air by staff, include messages regarding the connectedness of streets to local creeks, the importance of recycling, and reducing waste.

The District hosts annual community creek cleanup events, encouraging volunteers to become familiar with the environment, see the impacts of environmental apathy, and take personal responsibility for environmental protection and sustainability.

The District is active in the Bay Area Pollution Prevention Group (BAPPG), a group of 43 Bay Area Wastewater Agencies that work together to coordinate pollution prevention activities. The group provides research and guidance to members and the public on the impacts of pollutants. More information on BAPPG is available under the Committee pages at <http://www.bacwa.org>.

### *Performance Measures & Results*



<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>School Water Education Program (SWEP) Partnership</i>	2100 students reached in the 2014/2015 school year
<i>Sewer Science</i>	100 High school students participated in the week long lab in 2015-2016
<i>Plant Tours</i>	Over 300 people participated in plant tours in 2015, including students and industry colleagues
<i>No Drugs Down the Drain (NDDD) Prescription Drug Take Back Events</i>	Drugs collected from over 300 residents of Fairfield / Suisun City during 3 events in 2015
<i>Career Fairs</i>	Over 100 high school students reached at 3 career fairs / career day events in 2015
<i>KUIC Hometown Green Radio Spots</i>	Public service announcements, written and read on-air by FSSD staff, reach an average of 200,000 listeners per week.
<i>Point-of-purchase pesticide outreach</i>	1500 citizens shopping for pest-control products reached in 2015.
<i>Participation in Community groups</i>	FSSD staff is active in Rotary Clubs, the Fairfield-Suisun Chamber, and the Solano Economic Development Corporation (EDC)
<i>Participation in Industry Associations</i>	FSSD Staff participates in 15 industry associations and task forces, holding office on 10 committees/boards
<i>Local News Coverage</i>	27 news stories posted in the local newspaper (the Fairfield Daily Republic) since January 2014.
<i>Social Media</i>	Accounts maintained on 4 major social media outlets, with approximately 100 followers
<i>Creek Cleanup events</i>	Approximately 700 volunteers participated in cleanup events at 13 sites in 2015.

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>FSSD Website</i>	FSSD's newly-redesigned website promotes transparency through easy public access to Board and Regulatory information. <a href="http://www.fssd.com">Http://www.fssd.com</a> also provides technical details of wastewater treatment, as well as information on careers in wastewater. Nearly 15,000 page views since launching the new website in November 2015.

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy efficiency is considered as part of a life-cycle cost analysis when assessing alternatives for capital projects. Most recently, when considering new Aeration Blower equipment, the District looked at both capital costs as well as ongoing energy costs in selecting equipment. All major process area motor control centers (MCC's) have power metering incorporated to allow district staff to analyze and optimize power consumption.

On all major projects, the District engages the local power utility for review and suggestions on enhancing efficiency in the project.

Have completed and are undertaking numerous projects resulting from an Integrated Energy Audit completed in cooperation with Pacific Gas and Electric.

Projects include installation of a more energy efficient digester mixing system and installation of premium-efficiency motors when replacing pumps.

#### *Performance Measures & Results*

- Optimize energy management: Operation of treatment plant processes involving major equipment, such as tertiary filter backwash pumps, are adjusted to occur during periods of the day when they can be powered by the District's renewable energy sources rather than imported electrical power.
- Decision-making using life cycle cost (LCC) analysis: Equipment selection decisions for recent major maintenance and capital projects have been based on a life-cycle cost analysis to ensure that energy efficiency plays a key role in decision making.

#### **ENERGY GENERATION & RECOVERY**

- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

The District has worked to expand its energy independence through energy efficient designs and the incorporation of multiple alternative energy initiatives. The plant is powered in part by wind turbines, hosts a one-megawatt solar facility, and utilizes a cogeneration system that uses byproducts of wastewater treatment to create energy used onsite.

Using the LystaMize product from the OMRC will increase gas production and increase the electricity production from the District's cogeneration engines. The technology will be applied to other organics in the solid waste stream to generate more gas for cogeneration or for transportation fuel.

The District's wastewater facilities are the first in the state of California to be powered in part by wind turbines.

The District is one of the founding agencies in the 19 member Bay Area Biosolids to Energy Coalition that has been driving biosolids to energy solutions for the San Francisco Bay Area. There are 5 projects underway in the Bay Area that will increase energy from biosolids that are currently landfilled or land applied.

#### *Performance Measures & Results*

Renewable energy utilized: In 2015, nearly 2.5 million kWh produced from solar farm and wind turbines, or approximately 23% of total imported energy.

Cogeneration energy produced: In 2015, cogeneration engines produced 5.6 million kWh from digester/natural gas, or approximately 52% of total imported energy.

## **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities

The addition of the OMRC will capture the nutrients in the dewatering sidestream, reduce the resources necessary to treat nutrients in the plant, and reduce these nutrients in the effluent. The sidestream nutrients will enhance the nutrient content of the OMRC's biofertilizer.

The District has partnered with AFS BioOil to advance algae production technology and the opportunity to utilize resources from wastewater treatment plants. One of the products developed at the Algae Production facility will capture carbon and nutrients from wastewater treatment to produce bio oil that can be used for make marketable product including biodiesel.

### *Performance Measures & Results*

- Public Private Partnership with Lystek: 100% of Nutrients in the dewatering sidestream will be captured in the biofertilizer product. Production of methane will increase by 25% thereby increasing electricity generated and reducing energy purchased from local utility.
- Public Private Partnership with AFS BioOi: A small scale production facility was constructed in 2011 and has been evaluating the use of dewatering sidestream to capture carbon and nutrients.

## **WATER REUSE**

- Investments in reuse infrastructure

The District has produced and managed the use of recycled water in Fairfield and Suisun City, under SF Bay Regional Water Quality Control Board regulation, since 1978.

Recycled Water produced at the District Wastewater Treatment Plant (WWTP) is delivered to turf farms adjacent to the WWTP for crop irrigation, and also to a tank near the WWTP entrance. Recycled water is trucked from this tank to a landfill, where it is used for dust control.

District recycled water is disinfected using Ultraviolet (UV) Light as an alternative to chlorine disinfection.

### *Performance Measures & Results*

- Water Reuse: Treated wastewater is provided to the Suisun Marsh to enhance water quality, particularly dissolved oxygen, to areas of the marsh where low flow conditions result in poor water quality. Approximately 90% of the annual processed wastewater is supplied to the Marsh

- The Fairfield-Suisun Water Recycling Program (FSWRP) distributed approximately 10% of its processed wastewater or 430 million gallons of recycled water in 2015.

## **WATERSHED STEWARDSHIP**

- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

The District is an active participant in the Bay Area Clean Water Agencies efforts in cooperation with the Regional Water Quality Control Board to design and implement effective regional permitting strategies for advancing management of effluent mercury, PCBs, and nutrients to meet or exceed water quality objectives laid out in water quality plans.

The District provides program management for the Fairfield-Suisun Urban Runoff Management Program (FSURMP), helping the cities of Fairfield and Suisun City comply with stormwater NPDES permit provisions involving stream monitoring, pollutant reduction, and trash management.

The FSURMP, which includes FSSD as well as the Cities of Fairfield and Suisun City, participates in a regional effort to create a green infrastructure framework, and FSSD has committed matching funds as part of a grant proposal for PCB's in building materials and public infrastructure.

### *Performance Measures & Results*

- Evaluation of PCBs and mercury in urban runoff: The FSWRP has evaluated industrial parcels throughout the cities of Fairfield & Suisun, and determined that PCB and mercury levels in the 2 parcels most likely to be PCB sources were in fact insignificant, as confirmed by sediment sampling.
- Installation of Trash Capture Devices: THE FSURMP has installed multiple trash-capture devices in the District service area, with plans to install additional units in 2017.
- Modified Stormwater Pump Station Operation during dry weather: Urban runoff collected in the State Street pump station is diverted to the WWTP during dry weather to reduce low-DO discharges. Because PCBs have been detected (at very low levels) at this station, this action also qualifies for reduction credit under the PCB Stormwater TMDL.

## ***Glenbard Wastewater Authority IL***



### **Glenbard Wastewater Authority IL**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Watershed Stewardship**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type: Wastewater Authority (Treatment Plant, CSO Treatment Plant, no sewers)		
Service Area (square miles): 22.47	Average annual daily flow (MGD): 16.02	
Population Served: 109,125		
<b>Location</b>		
Street Address: 21 W 551 Bemis Road		
City: Glen Ellyn	State: IL	Zip Code: 60137
<b>Contact Information</b>		
Name: Matt Streicher	Phone: 630-790-1901 x126	Email: mstreicher@gbww.org

**NARRATIVE:** The Glenbard Wastewater Authority is located in Glen Ellyn, IL, and serves the Villages of Glen Ellyn and Lombard, as well as other surrounding unincorporated areas. The design average daily flow is 16.02 MGD with a peak flow of 47 MGD, and a population of approximately 109,125 being served. The main treatment plant consists of preliminary treatment, primary treatment, high purity oxygen activated sludge process, tertiary filtration, and UV disinfection (seasonal). The Authority also owns a remote Combined Sewer Overflow (CSO) facility that is only operated during wet weather. The CSO facility consists of preliminary treatment, primary treatment, and disinfection. The majority of the Authority’s service area consists of separated sanitary sewer, however some portions of the collection system are combined sewers, which created the need for the CSO facility.

The Glenbard Wastewater Authority fosters the attitude that we are no longer a wastewater treatment facility, but instead a resource recovery facility, as the influent water we receive has many valuable resources that can be recovered. While the Authority’s official motto is “Protecting the Environment for Tomorrow,” one of the main initiatives of the Authority is to become a net zero facility. Some of the many benefits of striving to become net zero are the positive environmental impacts, as well as the ability to minimize increases in rates to customers. Instead of solely collecting wastewater and cleansing it to meet permit limits prior to discharge to waterways, the Authority strives to transform itself into a manager of valuable resources, a partner in local economic development, and a member of the watershed community seeking to deliver maximum environmental benefits at the least cost to the society. It does this by reclaiming and reusing water, examining the benefits of extracting nutrients and other constituents, capturing waste heat and latent energy in biosolids and liquid streams, generating renewable energy using biosolids, and using green infrastructure to improve urban quality of life.

The Authority promotes an organizational culture in order to become a utility of the future today. Some of the many ways the Authority accomplishes this are through the involved and well-organized senior leadership team, actively engaging employees to improve upon inefficiencies as well as share ideas,

monitoring progress towards meeting goals and milestones, and maintaining open lines of communications with peers and others in the industry striving for the same goals.

The Authority encourages innovative thinking and ideas that can be implemented within its processes in order to achieve better results, while also lowering impacts to the environment and its constituents. It rewards its peers and employees for these types of behaviors with recognition, respect, and celebration of victories for the facility - which helps promote this continued progressive attitude. Innovation is taking place because it's good for the Authority, the environment, the community, and the economy. To demonstrate the high value of its staff and peers, the Authority drives an awareness and commitment to workplace safety and safety to the general public, which takes precedence on all other matters. Safety is a paramount aspect of showing respect and importance for the people who make the difference, as well as the general public.

The Authority demonstrates the Utility of the Future approach through many additional different activity areas besides promoting a progressive organizational culture. Some other areas include beneficial biosolids reuse, community partnering and engagement, energy efficiency, energy generation and recovery, nutrient and materials recovery, water reuse, and watershed stewardship. The following paragraphs summarize how the Authority is participating in the above mentioned activity areas.

The Authority promotes the beneficial reuse of biosolids by bidding out and executing contracts for the biosolids to be reused as fertilizer on farm fields, instead of landfilling or incineration. Along with NPDES permit requirements for standards in the biosolids, the Authority strives for the cleanest and most usable biosolids to promote its ability to be reused instead of wasted.

The Authority participates in community partnering and engagement in many ways. First and foremost, the Authority remains as transparent as possible, enabling the public to see the efforts that are performed not just to protect the surrounding environment, but to lower the economic impacts to the community. The Authority also participates in educational events that include visiting local schools to educate on the need for clean water, hosting tours to various groups to demonstrate the efficiencies of the processes used, and participate in humanitarian groups that promote water stewardship.

As previously mentioned, one of the Authority's primary goals is to achieve net zero energy use. Energy efficiency and energy generation/recovery are key aspects to this goal. Some of the many ways the Authority achieves energy efficiency are the use of variable frequency drives, utilization of motion sensors/LED lights, utilization of automation to better optimize the treatment process, utilizing energy conserving equipment wherever possible, evaluating energy efficiency for all equipment purchases and capital projects, and participation in voluntary energy efficiency programs. The main course the Authority achieves energy generation/recovery is through the recently installed combined heat and power system. Methane gas produced from the anaerobic digestion process is used to fuel engines that produce electricity and heat, which is then reused in the treatment process. The Authority is currently in the process of installing a FOG receiving station in order to further production and use of the methane digester gas. The FOG station will give the Authority an enhanced production of methane gas, which gives value to the nutrient and materials recovery aspect of being a Utility of the Future. The enhanced gas production allows the ability to produce more energy and heat to be used in the process, which lowers the overall energy usage, and in turn saves money to the community.

For many years the Authority has demonstrated proactive water reuse of its treated effluent. First and foremost, the water is reused for on-site irrigation and process water (seal waters, cooling towers, etc.). The reuse of the water for irrigation purposes at a nearby golf course was also investigated. In a project that has already been given the notice of intent to award, the Authority is proposing to provide additional year round disinfection to effluent water to insure it is suitable quality fit for reuse, and then reuse it in toilets and other applications. In order to demonstrate the cleanliness of the water, it is also proposed to reuse it in an aquarium that will be placed in the administration area for easy viewing access by visiting public.

Finally, the Authority actively participates in water stewardship through many channels. The main avenue is through the participation in the DuPage River Salt Creek Workgroup (DRSCW). The DRSCW offers a cost-effective alternative to the more formal TMDL process, which could serve as a model for other watersheds faced with similar challenges. The 360 square mile DRSC watershed in northeast Illinois lies in two counties and is home to 55 municipalities, 25 publicly owned treatment works (POTWs) that collectively discharge 15 MGD, 41 permitted MS4 stormwater discharges, and more than 21 dams that have significantly altered the hydrology of its natural waters. The workgroup's goal is to develop a holistic integrated protection approach to manage significant potential sources of contaminants in the watershed, improve surface water quality, and avoid transferring pollutants from one resource to another – all while trying to achieve those results in the most cost effective method to the general public. DRSCW achieves this through water quality monitoring, bio-assessment, modeling, adaptive management, and public education.

In summary, the Glenbard Wastewater Authority strives to be a utility of the future through many means, some that are summarized above. The 1972 Clean Water Act called on regulators and the regulated community to find solutions to America's water quality challenges by working together at the area-wide or watershed scale. We have accomplished a great deal with these programs and the nation benefits from significantly cleaner water bodies. However, it has come time to redefine this 40-year-old approach and acknowledge a paradigm shift from a treatment of wastes to a recovery of resources. The Glenbard Wastewater Authority aims to accomplish this through its goal to become a Utility of the Future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Established an integrated and well-coordinated senior leadership team

Provides opportunities to consult with employees in new processes, innovations and designs before building



Provides opportunities for employees to find and fix inefficiencies and share ideas for solutions to problems

Drives an awareness and commitment to workplace safety

Maintains attention to employee morale including opportunities to celebrate victories for the facility

Established periodic tracking of progress toward meeting goals and milestones

Financial sustainability; asset management; long range financial planning and policies

*Performance Measures & Results*

- Bi-monthly team meetings - Employee Attendance/Involvement
- Level of employee engagement in goals and visions - 100%

**BENEFICIAL BIOSOLIDS USE**

- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Ongoing exploration and evaluation of alternative uses for biosolids

*Performance Measures & Results*

- Percent of biosolids beneficially used vs. total volume produced on an annual basis - 100%

**COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)

Outreach conducted with other stakeholders and other community groups – local schools, DRSCW

Actively promote community awareness of the value of water and wastewater treatment’s role in the social, economic, public, and environmental health of the community

Involve stakeholders in the decisions that will affect them, understands what it takes to operate as a “good neighbor,” and positions the utility as a critical asset to the community

*Performance Measures & Results*

- Number of Specific Projects Completed Associated with a Partnership (DRSCW) - 2 completed; many future projects listed in NPDES permit special conditions
- Number and Type of Formal Recognitions - CSWEA Safety Award; Conservation Foundation Clean Water Award; NACWA Silver Award

## **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy efficiency master plan and communications strategy as part of an overall strategic plan

Energy efficiency team established and empowered to implement master plan and communicate results to staff

Energy efficiency evaluated for all equipment purchases and capital projects

Conduct and participate in research activities

Utilization of energy conserving equipment wherever possible

### *Performance Measures & Results*

- KWh reductions 36kW

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes

Co-generation systems

FOG receiving station

Heat recovery system

Co-Digestion system

Investigation into use of solar energy

### *Performance Measures & Results*

- Reduced non-renewable energy use and carbon footprint - 33%
- Cost Savings Due to being recently implemented, cannot determine at this time
- Reduced reliance on the power grid - 100%
- Percent increase in renewable energy production - 33%
- Percent of total plant power demand that is generated on-site from renewable sources - 33%

### **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)

Participation in the DRSCW involves: Holistic, integrated protection approach to manage significant potential sources of contaminants in the watershed that improve surface water quality and avoids transferring pollutants from one resource to another; Integrated programs to address wet weather issues; Systems that add value to the urban landscape with resilient, adaptable, affordable and environmentally sensitive water infrastructure that continues to provide basic services, but also enhanced recreational, aesthetic and environmental value; Evaluation of water quality trading options

Participate in voluntary programs; DRSCW; Central States Water Environmental Association; Illinois Association of Wastewater Agencies; Global Water Stewardship

### *Performance Measures & Results*

- Reduction in wet weather impacts: CSO Facility treats 100% of combined sewer flow
- Reduced unit costs for water quality improvements - Participation in DuPage River Salt Creek Workgroup (DRSCW)
- Enhanced Pollution Mitigation - Participation in DuPage River Salt Creek Workgroup (DRSCW)
- Increased Hydrologic Stability - Participation in DuPage River Salt Creek Workgroup (DRSCW)
- Creation or Enhancements to Wetland Areas for Natural Treatment/Storage - Participation in DuPage River Salt Creek Workgroup (DRSCW)

## Gwinnett County GA



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### Gwinnett County GA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Energy Generation & Recovery



Nutrients

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Multiple plants		
Service Area (square miles): 437	Average annual daily flow (MGD): 68	
Population Served: 895,823 (2015 U.S. Census)		
Location		
Street Address: 684 Winder Highway		
City: Lawrenceville	State: GA	Zip Code: 30045
Contact Information		
Name: Tyler Richards	Phone: 678-376-6923	Email: tyler.richards@gwinnettcounty.com

## **NARRATIVE: Organizational Culture**

**Proactive Leadership:** The Gwinnett County Department of Water Resources (DWR) is an integral part of our growing and thriving community. Our mission is “Superior Water Services at an Excellent Value.” The Services referred to in the mission are more than just delivering clean water and treating wastewater. Our Services help the County and the various communities meet their objective of making Gwinnett a great place to live. Accomplishing this takes a lot of communication and outreach. All of our higher-level management members are active in local Rotary groups. Our staff participates in meetings that are held regularly with the various Cities, Community Improvement Districts, and community service organizations, as well as the public school system. Out of this communication have come several important projects that will benefit DWR and the community. One is the Water Research and Education Center that will serve as a hub of innovation for the water industry. Another project is the Beaver Run Wetland Project. This project will provide water quality improvements, community recreation, and education, as well as create a link to County and City trail systems. These projects happen when proactive leadership ensures our entire Department works as a partner with the community.

**Collaborative Organization:** Our Department has been going through reorganization for the last five years. The goal has been to bring the concept of ‘One Water’ to every level of the organization. We have changed from an organization with silos around the type of water — wastewater, water, Stormwater — to one where we are organized around function. For example, all the engineering and construction staff from each ‘water’ area were combined in a single group. Additionally, the field crews from distribution, collection and Stormwater were combined in a group. This new structure allows the sharing of work experiences across traditional department lines, bringing fresh concepts to the newly aligned workgroups. In addition, it has given a greater opportunity for staff advancement within the new groups.

As part of our asset management program, we subject any project over \$1 M to a business case evaluation (BCE). This has provided an opportunity for all levels of staff to be involved as a part of a BCE team. We look for ‘out of the box’ thinking, which means we bring in employees who work in areas unrelated to the BCE project.

Our mission states that we will achieve it through education, innovation and personal commitment. We believe that innovation is key to improvement. To enable this, many of our staff throughout the organization are sent to visit other high performing utilities and research programs, or to conferences to bring back new ideas. One example is a recent trip by field operations staff to St. Louis to learn about their employee skills development and apprenticeship programs. In recent years, engineering and operating staff made a trip to California, bringing back information to share on innovative biosolids treatment projects

**Workforce and Leadership Development** – DWR has always had a good leadership-training program through the University of Georgia. In the last few years, the overall training program has taken a giant step forward with the hiring of a Training Manager, along with a significant increase in funding for training. Now the staff development program is about to take another leap forward with the implementation of an Employee Skills Development Program. This program is developing the skills, knowledge, and ability (KSA) necessary for each position. Employees will have the opportunity to gain and demonstrate those KSAs and be promoted through a career ladder without having to wait for another employee to vacate a position. This will provide opportunities for advancement and increased

responsibilities, allowing employees to reach levels of competency and encourage retention. We have engaged the employees in this effort and they are helping develop the KSA's necessary for the different functions. To gauge the employee level of interest we performed a survey recently that received a 90% response rate. It indicated that our employees are ready to learn new skills, including skills in the areas of management and leadership, and want to improve and move up in the organization.

Employee In-Reach – When DWR went through a reorganization a few years ago, we realized we needed to improve our internal communication. We developed a shorter, easier to remember mission statement and vision. Each Deputy Director was responsible for meeting with their staff regularly to have open communication about our mission and how it related to the organizational changes. First line supervisors were identified that would work to ensure that questions from employees were brought to the leadership team and answers would flow back to the employees. A monthly newsletter was developed to celebrate achievements and inform of progress. A group of employees, on their own, began a 'Positive Energy Team' that promoted fun activities that would include all staff. Since then they have had pumpkin carving contests, cake walks and chili cooking contests. These shared fun activities have improved communication across the various workgroups and made the staff feel like a team with a common mission.

Innovation – DWR staff recognize the importance of continuous improvement. There is a constant push for new or improved technology or processes. It is such a part of the culture that there are too many instances to name. Our Technical Service Group was formed specifically to research and develop new technology, but this happens everywhere in the organization. Some examples are as follows:

We needed a way to assess the condition of our forcemains. We worked with our Purchasing Department to contract with a company that had developed new technology. If the technology worked, we would pay them. If it did not work, then we would not pay. The technology was very expensive and this allowed a 'trial' without risk.

We have a 'lean' project team that involves over 30 staff from DWR and staff from the Department of Planning and Development. The team's goal is to create a more effective way of addressing new development from start to finish.

Our Ultraviolet disinfection process was having problems. Staff did some bench trials with PAA and ended up installing it full scale as a backup to UV disinfection.

Our field operations staff is working with ATT/Qualcomm/CH2M on a 'smart cities' initiative to install smart meters, both in the pipes and at the homes in an area of the distribution system, to detect water leaks.

Our on-going research program is funded in both our CIP and Operating Budget. A direct potable water reuse study is currently underway at one of the County's water reclamation facilities. Since 2013 the County has been involved as a participant or a principal investigator in over 23 national research projects in partnership with Water RF, WERF and WateReuse RF. This has allowed DWR staff to grow their skills and know they are benefitting the entire water community.

Activity Area 5: Energy Generation & Recovery The "Gas to Energy" system at the F. Wayne Hill Water Resources Center (WRC) takes an unpleasant byproduct of the wastewater processing system and turns it into something that helps the environment and the county's residents. Bacteria in the egg-shaped

digesters turn wastewater solids into methane gas, reducing the waste that goes to landfills. The P.O.W.E.R (Processing Organic Waste for Energy Recovery) system uses the methane gas to drive a 2.1-megawatt generator that helps power the Center.

In addition, F. Wayne Hill receives high-strength waste streams, such as fats, oil and grease waste and other food processing wastes to add to its digesters. This generates additional methane while generating revenue from disposal fees.

**Activity Area 6: Nutrient Materials Recovery** The Ostara nutrient recovery process at the F. Wayne Hill Water Resources Center (WRC) is a clean technology project that converts a waste product, produced during the water reclamation process, into an environmentally sound, slow release fertilizer.

The F. Wayne Hill WRC has one of the most stringent limits on phosphorus and ammonia discharge in the United States. Both of these nutrients can cause overgrowth of algae in lakes and ponds, negatively affecting drinking water, wildlife and recreational uses.

The Ostara nutrient recovery process (known as the Pearl process) is an innovative process that takes the phosphorus, removed from wastewater during treatment, and combines it with ammonia and magnesium to make 'struvite,' which is a fertilizer. Struvite will not dissolve in water and, therefore, will not impact runoff from fertilized land to lakes and streams. Struvite only dissolves when in contact with the root of a plant. Ostara markets and sells this product as 'Crystal Green.'

Using two of Ostara's Pearl 2000 reactors, Gwinnett County's nutrient recovery facility has an annual Crystal Green production capacity of up to 1400 tons. The County receives revenue for every ton of fertilizer it produces. In addition, the nutrient recovery facility creates annual cost savings in chemicals, solid waste disposal, maintenance and power. This benefits, not only the environment, but Gwinnett County ratepayers as well.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

**Employee Skills Development Program:** A partnership between employees and DWR designed to increase employee and organizational knowledge, skills and abilities.

Active co-op and internship program

Employees at all levels of the organization visit other utilities that are considered “best in class” to gain firsthand knowledge of the processes and practices that make these utilities the “best.”

Apprenticeship program in development, in tandem with the Employee Skills Development Program.

#### *Performance Measures & Results*

- Number of sessions: Since January 1, 2016, there have been 177 training opportunities, with an average of 20 training hours/employee
- Type of training: Includes everything from equipment use to software to management topics
- Level of employee engagement in goals & vision of Utility of the Future business model: This business model is being rolled out in conjunction with the Employee Skills Development Program
- Number of open positions internal candidates can qualify for The Employee Skills Development Program is designed to help track this metric
- Resource efficiency improvements Gwinnett County DWR has approximately 50% of the number employees of like-sized utilities. We believe our organizational structure allows us to be lean and efficient.
- Co-op and intern positions GCDWR currently has 4 co-op students and 15 interns
- Visits to “Best in Class” Utilities Employees at all organizational levels visit these utilities.
- Utility Organizational Involvement Employees at all organizational levels are encouraged to join and become active members of various utility organizations (GAWP, NACWA, etc.)

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed
- FOG recovery stations

#### *Performance Measures & Results*

- Carbon dioxide reduction >15,000 metric tons per year
- Reduced reliance on power grid System generated ~ 15% of plants power needs in 2015
- Cost savings/avoided energy costs ~ \$350,000 (based on average rates in 2015)
- Reduced volume of waste to landfill

### **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees



- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities
  - Recovery of phosphorus for beneficial reuse
  - Implementing private company involvement in new technology for nutrient recovery/sale
  - Revenue generated from sales of nutrient

*Performance Measures & Results*

- Phosphorus recovered 85% Nitrogen recovered 40% Material recovered/marketed via Ostara 1,400 tons

## Hermitage Municipal Authority PA



### Hermitage Municipal Authority PA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Energy Generation & Recovery

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): <b>Regional System</b>		
Service Area (square miles): <b>29.6</b>	Average annual daily flow (MGD): <b>3.45</b>	
Population Served: <b>16,500</b>		
Location		
Street Address: <b>2133 Broadway Road</b>		
City: <b>Hermitage</b>	State: <b>PA</b>	Zip Code: <b>16148</b>
Contact Information		
Name: <b>Thomas Darby</b>	Phone: <b>724.347.4941</b>	Email: <b>tdarby@hermitage.net</b>

**NARRATIVE:** The Hermitage Municipal Authority is a regional utility that provides collection, conveyance, treatment, and reuse of wastewater in the area surrounding the City of Hermitage, Mercer County, Pennsylvania. The Authority receives wastewater from a total of five municipalities and administers the capital planning and finances of the operation. The facility is operated and optimized by the City of Hermitage, with some staff having dual employment with the City and Authority to provide commonality of vision and leadership. The City Staff are managed by a Superintendent that reports to the City Manager, along with reporting to the Authority Board.

The City Staff are organized in a department that focuses on wastewater collection and treatment. Crew leaders are assigned to each major area of the facility, including wastewater collection system and pump stations, hydraulic treatment train, biosolids treatment train, and food waste receiving. The facility receives FOG, septage and pre-/post- consumer food waste and recalled products for co-digestion, and manages that portion of the facility as a merchant facility with income generated from waste diversion from landfills. To date, the Authority and City have received waste and recalled food products from 26 different states, converting all of it to renewable energy through the on-site combined heat and power (CHP) unit.

The Authority and City focus on a Sustainability Mission and used the last capital upgrade of the wastewater treatment plant to propel the Authority in a new direction. In lieu of a conventional upgrade, the Authority selected an advanced anaerobic digestion process that produces a Class A Biosolid for Soil Amendment, while maximizing biogas production with co-digestion. Synergistically, this strategy allowed the Authority to focus on the two highest non-labor cost centers for the facility, landfilling of biosolids and electricity. The program implementation has been very successful, documenting over \$320,000 in annual cost reductions for the Authority and City.

The City Staff continue to collaboratively identify opportunities for improvement and the Authority and City meet quarterly to review their Strategic Plan and new opportunities. Recently identified collaborations include:

- Partnering with a regional grocery chain to identify opportunities for food and waste diversion
- Partnering with the local school district to experiment with food scraps for co-digestion
- Completion of a study to convert biogas to renewable CNG for vehicle fleet and commercial sale
- Identification of opportunity for solar energy and battery storage

Outside of opportunities for wastewater and renewable energy improvements, the City reviews quarterly its staffing and management structure to identify opportunities to improve efficiency. This group, including Authority Board Members and City Management, question key performance metrics and staffing levels. Recently identified improvements for evaluation include:

- Elimination of weekend pump station labor in lieu of SCADA improvements to manage the loss of staff from retirements
- Evaluation of laboratory practices to diversify labor practices and reduce weekend staff requirements
- Expansion of biosolids processing to seven days a week from five days to account for increased food waste receiving.

The Authority is now evaluating its next direction for improvements and views of the Utility of the Future Today program as an opportunity to incorporate other best practices and rebrand the Authority and City operations and mature its staffing to meet their changing operations.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Reorganization of staffing structure as the addition of food waste receiving and biogas utilization has changed the business model of the Authority. Creating structure to allow employees to seek entrepreneurial activities to reduce authority costs or increase revenues.

### *Performance Measures & Results*

- Safety and Training Committee - Meets monthly to identify safety concerns and pathways for correction. Also identifies need training and coordinates training activities.

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Ongoing exploration and evaluation of alternative uses for biosolids through partnership with local business incubator. Sponsoring the business startup of use of biosolids for intensive indoor growing operations and potential of fecal substitute.

Adequate staffing to support programs by using dedicated plant staff for biosolids operations and procedures.

Risk management strategies in place to address threats to sustainability of practice through Safety and Management review of monthly performance data and biosolids applications.

### *Performance Measures & Results*

- Impact on customer rates: Eliminated approximately \$200,000 in landfilling costs by conversion of Class A biosolids
- Increase in agricultural land application: Sourced and located participants to allow for 100% of generated biosolids to be used in Agricultural Land Application

- Routine Monitoring of Anaerobic Digestion: Performance Exceed Class A requirement for Fecal Coliform by more than 800% and achieve 65%-75% Volatile Solids Destruction

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes

Developed Post-Consumer and Recalled Food Product Program and Receiving Waste from Businesses in MultiState Region, including Fortune 500 companies in Fast Food and Dairy.

Installed food depackaging equipment to facilitate recycling of food packaging materials and to provide clean stream of organics for Anaerobic Digestion

Pursuing energy storage and solar/PV to further enhance Renewable Profile

### *Performance Measures & Results*

- Percent of energy use that is renewable: 23% of total plant electrical usage is from renewable biogas generated on-site
- Renewable Energy Credit generation: Participation in the Pennsylvania Alternative Energy Program and has achieved Certification of Renewable Energy Credit Generation
- Change in the resilience of critical infrastructure: Produce 100% of the needed power for facility on-site through CHP. Blending of natural gas and biogas to maintain Net Zero Electrical
- Usage Use of Renewable Compressed Natural Gas: Undertook study to evaluate the cleanup and compression of biogas for vehicle fuel

## Hampton Roads Sanitation District VA



### Hampton Roads Sanitation District (HRSD) VA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Watershed Stewardship

#### Utility Description (combine all plants if a multi-site system)

HRSD -A Regional Wastewater Agency 250 MGD capacity  
 Service Area (square miles): 3100 Average annual daily flow (MGD): 150

Population Served: 1,700,000

#### Location

Street Address: 1434 Air Rail Avenue  
 City: Virginia Beach State: VA Zip Code: 23455

#### Contact Information

Name: Ted Henifin	Phone: 757-460-4242	Email: thenifin@hrsd.com
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**NARRATIVE:** Management guru Peter Drucker is widely attributed with saying "culture eats strategy for breakfast." The HRSD story would affirm that hypothesis with the caveat that the current organizational culture of learning, innovation, high performance, personal accountability, team work and a relentless focus on a single vision was not created by accident but was the result of implementing a long-term strategy to change organizational culture. The transformation has been years in the making. A major leap forward occurred with the development and adoption of a values-based strategic plan in 2009. This plan identified five key areas of emphasis; people, environmental impact, infrastructure, operations and partnerships. Additionally the plan articulated our vision; future generations will inherit clean waterways and be able to keep them clean. The strategic plan and vision established the standards upon which all decisions are measured against.

One focus of the people element of the strategic plan is "ensuring the talent we have is used effectively." To that end HRSD has an established, robust process of engaging all employees in looking to improve any and all areas of our organization. All employees attend two foundational trainings designed to unlock the potential in every employee to actively find new and more efficient ways to conduct business. The program has three major elements, an introductory session (Your Role in Quality) that is provided to all employees within their first year at HRSD, and a problem solving course (teams and Problem Solving) that is provided within their first five years at HRSD. A follow on leadership development course (Leadership and Management Program) is provided to those individuals identified as potential future leaders within the organization. The quality training is put into practice each year with an annual planning day held in each work center. These sessions are facilitated by a volunteer cadre of HRSD employees trained in facilitation skills. These facilitators come from all levels and aspects of the HRSD organization and provide this vital service in addition to their regular jobs. The annual planning days provide opportunities to review operations, brainstorm new ideas and prioritize the work plan for the coming year. Items identified in these sessions are typically addressed with teams of employees using the problem solving techniques they learned in the quality training program. Items that impact areas across a broader spectrum of the entire organization are elevated to the senior leadership team for evaluation during the coming year. This entire process helps create a culture of inclusion, continuous improvement and employee engagement.

Within the environmental impact element of the strategic plan one focus area is "fostering a culture of conservation and recycling." A cross functional team of employees formed a Sustainability Advocacy Group (SAG) to review organizational and individual practices that are focused on reducing human impact on the environment, a key element of the strategic plan. The SAG has identified and implemented many sustainable practices throughout the organization over the past several years. The employee team develops and pilots ideas. Once proven on a pilot scale, these ideas and programs are presented to senior leadership for approval. Once approved the SAG implements the programs throughout the organization and monitors results. The SAG is responsible for expanding HRSD's single-stream recycling program, paper reduction policy, annual carbon footprint calculation, triclosan-free cleaning product and Energy-Star purchasing policies, disposable cup policy and oyster farming and reef building at some treatment plant locations. The SAG engages employees in identifying and implementing sustainability practices (big and small). While much of this effort is focused on ancillary

activities, the excitement and creativity carries over into the regular work of every employee as all are encouraged to look for ways our processes can become more efficient and sustainable.

HRSD has always valued credentialed education and training and provides a generous tuition payment program to enable employees to pursue degree programs at every level. A variety of work force development training opportunities are presented throughout the year and the number of training hours per employee is a strategic metric tracked throughout the organization. HRSD established the nation's first wastewater apprenticeship program in 1979. The HRSD apprenticeship program provides the training for operators, maintenance operators, electricians, automotive technicians, interceptor technicians, instrumentation specialists, carpenters and machinists that allows them and HRSD to be successful. The four-year program requires intensive classroom work while obtaining proficiency in trade skills through on-the-job training. More than 400 individuals have graduated from this US Department of Labor approved program since its inception with a current average of 12 graduates each year, providing the skilled workforce necessary to meet current and future demands of our challenging industry.

An intentional focus on partnerships in the strategic plan has helped HRSD become more fully engaged with the communities in which our employees and customers live, work and play. HRSD proposed a regional approach meeting regulatory wet weather requirements that was formally adopted by 14 local governments and ultimately approved by EPA and incorporated into HRSD's SSO consent decree. HRSD has assumed full responsibility and liability for regional wet weather capacity regardless of asset ownership. Under this concept, HRSD will identify defects in locality owned infrastructure that contribute to regional wet weather flow challenges and make those repairs with HRSD funds. This unique partnership allows HRSD to focus rehabilitation of the regional system in a more cost effective manner, resulting in an estimated \$1 billion in savings over the traditional siloed solution.

Organizational culture is ultimately dictated by the behaviors and actions modeled by senior leadership. HRSD's senior leadership team meets regularly with two executive coaches to explore "soft" topics like communication, empathy, emotional intelligence and related issues. These sessions have minimal agendas and provide time for senior leadership to really share frankly with each other about topics both personal and professional. Walking the walk (carving out time to build relationships, holding each other accountable and providing feedback through fierce conversations) helps establish accepted behaviors that form the HRSD culture. Beyond behaviors, the physical environment of office spaces, parking lots, break rooms and even coffee service reinforce the organizational culture. Senior leadership office spaces are sized and furnished identically to other supervisors, there are no reserved parking spaces and coffee and break areas are available to everyone.

While culture may eat strategy for breakfast, an organization cannot exist on culture alone. The organization needs to accomplish its mission, provide value for its customers and innovate to change and adapt with the market, the regulatory environment and ever evolving technologies. Regulatory compliance is the baseline at HRSD. Innovation is encouraged in every aspect of operations from customer service to biosolids recycling. HRSD has established a minimum investment level for research and development at greater than one-half percent of total revenue. This ensures a continued robust investment in research focused on reducing costs in the future.

Leveraging this investment, HRSD works in partnership with leading universities in Virginia and across the nation. In keeping with the "open architecture" concept for wastewater research, HRSD was instrumental in establishing LIFT with WE&RF and WEF to better coordinate research activities at



utilities around the world with the goal of moving innovation into practice sooner. Additionally, HRSD partnered with DC Water and WE&RF to create an innovation fund, funded with royalties from intellectual property and other innovations jointly developed, patented and commercialized.

A culture that encourages appropriate risk taking as well as investment in new technologies has positioned HRSD well to face future challenges. HRSD has recently embarked on a new initiative to add additional treatment process to produce drinking water quality effluent and pump that into the regional groundwater aquifer to significantly reduce future discharges to the Chesapeake Bay, provide a sustainable source of groundwater for all of eastern Virginia, protect the aquifer from saltwater contamination and reduce the rate of land subsidence related to aquifer compaction. Pursuit of this bold initiative would not be possible without the culture of innovation and excellence firmly established at HRSD. The future will provide new challenges, but none HRSD is not prepared to address as HRSD is the utility of the future - today.

### ORGANIZATIONAL CULTURE

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Your Performance Measure(s)	Your Results (quantitative or qualitative)
<i>Internal Employee Promotion Eligible</i>	Goal 100% FY 15 64%
<i>Training hours per employee</i>	Goal 40 hours FY 15 42 hours
R&D Budget	Goal > 0.5% FY 15 1.0 %

### COMMUNITY PARTNERING AND ENGAGEMENT

- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Performance Measures & Results:

- Education and Outreach Events FY 15: 334
- Number of Community Partners FY 15: 321

**ENERGY EFFICIENCY**

- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Performance Measures & Results:

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Energy per MG - Treatment Plants	FY 15 2.189 kWh/MG
Energy per MG - Pump Stations	FY 15 159 kWh/MG
Energy per MG - Buildings	FY 15 104 kWh/MG

**ENERGY GENERATION & RECOVERY**

- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes

Performance Measures & Results:

- Alternative Energy Produced/Used: FY 15 6,123,399 kWh

**WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Performance Measures & Results:

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Carbon Footprint	FY -15 1.46 tons per MG annual total

## ***Kent County Public Works DE***



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### **Kent County Public Works DE**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Watershed Stewardship**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Kent County Regional Resource Recovery Facility:		
Service Area (square miles): 800	Average annual daily flow (MGD): 12.5	
Population Served: 125,000		
<b>Location</b>		
Street Address: 139 Milford Neck Rd.		
City: Milford	State: DE	Zip Code: 19963
<b>Contact Information</b>		
Name: James Newton	Phone: 302-335-6000	Email: james.newton@co.kent.de.us

**NARRATIVE:** The Kent County Regional Resource Recovery Facility (KCRRRF) is an advanced BNR facility. It is the only resource recovery facility in the U.S. to be certified to the ISO 14001, OHSAS 18001, and National Biosolids Partnership’s (NBP) EMS standards. It was first certified in 2006. The facility has been a national leader in promoting these programs among resource recovery facilities. As a result of its environmental, health and safety, energy and security management system (EHSES-MS), it has developed a majority of the attributes assigned to a utility of the future. The EHSES-MS has helped to establish an organizational culture that is advanced beyond the typical resource recovery facility. It has a leadership team that is focused on the future of the facility while ensuring it operates as efficiently as resources allow. The EHSES-MS has established objectives and targets that guide the facility into the near and long term.

It has made a commitment to developing its staff to their maximum ability. The facility is open to trying innovative ideas. The facility has installed a unique UV disinfection system and a solar biosolids drying system. The facility is considered by the U.S. EPA, Water Environment Federation (WEF) and the U.S., Department of Energy as a national leader and is often used in case studies and national presentations. The facility promotes from within and typically replaces promoted personnel from the general public and trains those personnel to reach their maximum potential. One of the reasons the facility implemented the EHSES-MS was to capture the “tribal” knowledge of long time employees before they retired through the development of work instructions. This prevents the next generation of employees from having to learn the same information by trial and error.

The KCRRRF has been beneficially reusing biosolids since the mid-1990’s. All of the biosolids produced by the KCRRRF is Class A. The biosolids process consists of dewatering using belt filter presses, lime addition for stabilization and drying using either indirect dryers or solar powered dryers. The biosolids produced are referred to as Kentorganite and given to local farmers as a soil amendment/fertilizer. The facility only charges to transport and spread the product. The product is listed as a 1% nitrogen/phosphorus fertilizer with lime. Local farmers are saved costs of virgin nitrogen, phosphorous and lime. Lime is a critical element for local farmers because of the lower pH of the sandy spoil.

The KCRRRF has been working with local communities since the inception of the facility in the early 1970’s. The county commissioners established the Sewer Advisory Board (SAB) to make recommendations to them for sewer expansion, projected budgets and other issues related to the facility. The SAB is composed of representatives from the contract users, local regulatory agencies and members of the public appointed by the commissioners. The KCRRF has also established partnerships with the Delaware Solid Waste Authority (DSWA) for the treatment of land leachate, which in the past was trucked by the DSWA over 75 miles for treatment. The KCRRF has provided tours to a variety of

groups both locally and nationally. The local Chamber of commerce and local school groups and teachers are often visitors to the facility.

Under is EHSES-MS, the facility has committed to becoming a zero-net energy facility. To achieve this commitment, the facility will implement a variety of energy efficiency and energy generation projects. These include the replacement of the aeration system blowers with more energy efficient turbo blowers and replacing 6 small emergency generators with a 2 MW unit that can be operated by the local electric utility when necessary. In 2014, the facility installed 1.2 MW photovoltaic solar farm and a pilot solar biosolids drying facility. The facility is investigating the operating of the aeration system by monitoring the nitrogen in the basins. The KCRRRF is currently participating in the U.S. Dept. of Energy's pilot program to become ISO 50001/SEP certified and has signed an agreement with the U.S. DOE's Better Plants program to commit to reducing energy usage at the KCRRRF by 25% over the next 10 years. The facility hired an energy service company to recommend changes to both operations and processes to become zero net energy. The facility has also budgeted to replace all existing street lights located around the facility with LED lights.

The facility through its biosolids program has been recovering nutrients, specifically nitrogen and phosphorous, by placing them on local farms as a substitute for virgin fertilizers. The facility solicits the cooperation of local farmers on an ongoing basis. It has numerous marketing materials to provide the necessary information to ensure that the farmer understands what Kentorganite can provide and how it saves the local farmers both time and money. The facility cannot provide all of the biosolids to meet current demand. Contracts are in place as needed. The facility also considered alternative uses of the biosolids including manufacturing the material as pellets as a wood pellet substitute and looked at bagging the biosolids and selling it through local garden markets.

The KCRRRF has been practicing watershed stewardship for a number of years. It has purchased local farmland and returned the areas back into its natural habitat. It is looking into converting the discharge canal into a series of artificial wetlands. The land beneath the solar farm was rebuilt using a green infrastructure approach. The latest NPODES permit will practice nutrient trading. Several properties purchased by the county were redeveloped in order to reduce the amount of nutrients released into the environment.

There is insufficient demand for the reuse of the treated water from the facility. Until such time as the state environmental agency pushes the reuse it will not occur. The facility did investigate using some of the treated water as makeup water for a gas turbine power plant.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development

program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees

- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

The KCRRRF is the only resource recovery facility in the U.S. that has an environmental, health and safety, energy and security management system (EHSES-MS) that is certified to the ISO 140001, OHSAS 18001 and National Biosolids Partnership's EMS standards and has been certified as such by an independent third party since 2005. It is also pursuing certification into the ISO 15001 and U.S Dept. of Energy's Superior Energy Performance (SEP) standards by 2017.

Established a Management System Core Team composed of senior leaders

State environmental agency (DNREC) accepts EHSES-MS objectives and targets as the approved long range plan for the facility, especially as related to SRF projects.

#### *Performance Measures & Results*

- Percentage of personnel trained on EHSES MS including annual goals: 100%
- Performance evaluation including EHS activities: Average of 3.1 out of 5.0
- Percentage of operators licensed by DNREC: 100%
- No. of management reviews conducted by the EHSES-MS Core Team: 3/year

### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

#### *Performance Measures & Results*

- Percentage of biosolids land applied as Class A: 100%
- Conservation of lime, nitrogen and phosphorous conserved: 1500 tons of lime, 17 tons nitrogen and 17 tons of phosphorous conserved
- Tons of carbon sequestered in the soil

### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)

- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Participation of the public through the Sewer Advisory Board: representatives from local contract users, the general public and state and local agencies included on the board. Board meets in an open forum and county commissioners rely on the board for recommendations on annual budget, sewer expansions and new projects.

In partnership with the Delaware Solid Waste Authority (DSWA), the KCRRRF treats landfill leachate through its sewer system. In the past DSWA trucked the leachate almost 75 miles to a treatment facility.

The KCRRRF conducts tours for a variety of community groups including the Kent County Chamber of Commerce and the Lake Forest and Dover School District science teachers.

The KCRRRF has conducted advertising campaigns to discuss the proper ways to operate a septic system and operates a fats, oils and grease removal program for local food service facilities.

The KCRRRF has been awarded a variety of national and regional environmental awards, including the 2007 US EPA National Clean Water Recognition Award for Operations and Maintenance for Large Facilities, the 2015 10 Years Platinum Award by the NBP, the American Academy of Environmental Engineers and Scientists 2013 Environmental Excellence Award for Small Firms, and been written up as a case study in a number of national publications.

#### *Performance Measures & Results*

- Number of SAB meetings: 10-12/year
- Local recreation partnerships: Kent County Sports Complex; DSWA
- Number of tours: 4-5/year
- Food Service Facilities permitted: 150+
- Number of regional and national awards for the KCRRRF: 10
- Number of case study citations by the US EPA, US DOE and WEF: 7

#### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Participating in the U.S. Dept. of Energy's pilot program to implement and become certified in ISO 50001 and Superior Energy Performance (SEP) programs, one of five such facilities within the country.

Participating in the U.S. Dept. of Energy's Better Plants program which requires a commitment to reduce energy consumption by 25% before 2025.

Looking to install energy efficient biosolids dryers within the next 2 years

Energy Service Company (ESCO) Feasibility Study

US DOE Industrial Assessment for Energy

#### *Performance Measures & Results*

- Improved energy efficiency in blowers: Project being designed
- Improved energy efficiency in basins: 10-15% reduction
- Switch to LED facility lighting: Project budgeted and one building converted
- GHG reduced from 2010 levels: 50% reduction
- Results of ESCO study: Reduction of energy related costs from -\$900,000 to +\$300,000
- Replacement of five 500 hp centrifugal blowers with 2 turbo blowers: Project in design stage

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Looking to become zero net energy facility within the next 10 years combining energy efficiency and energy generation.

Looking to adopt ISO 50001 and SEP management system

Investigated various sources of feedstock for anaerobic digestion including organic food wastes, yard

#### *Performance Measures & Results*

- Percentage of energy from 1.2 MW solar farm: 10-15% average over the last 4 years, about 6.5 GWhrs
- Biogas generation: Future project planned for this area
- Installation of a 2 MW distributed generator to replace 6 smaller generators thus reducing air pollution and ability to generate electricity for local cooperative: Project in design stage

### **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision



### *Performance Measures & Results*

- Biosolids land applied: 100%
- Marketing to local farmers: Have marketing package prepared, ongoing dialogue with local farmers, currently insufficient biosolids to meet current demand

### **WATERSHED STEWARDSHIP**

- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

### *Performance Measures & Results*

- Percent of watershed areas returned to natural environment: 5%
- Evaluated water conservation activities; such as eliminating high flow toilets: Evaluated a rebate program

## King County Wastewater Treatment Division WA



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### King County Wastewater Treatment Division WA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Energy Efficiency
- ★ Energy Generation & Recovery

Regional system – wholesale provider

Regional system – wholesale provider		
Service Area (square miles): 424 square miles	Average annual daily flow (MGD): 178 mgd	
Population Served: Approximately 1.6 million residents		
<b>Location</b>		
Street Address: 201 South Jackson St., Suite 500		
City: Seattle	State: WA	Zip Code: 98104
<b>Contact Information</b>		
Name: Annie Kolb-Nelson	Phone: 206-477-5373	Email: Annie.Kolb-Nelson@kingcounty.gov

**NARRATIVE:** King County's Wastewater Treatment Division (WTD) is an innovative clean-water enterprise that protects public health and water quality. We provide wholesale wastewater treatment services to 34 local sewer districts and cities, including the City of Seattle, and treat nearly 200 million gallons of wastewater each day for more than 1.6 million residents across a 424-square-mile area and three counties.

Our 630 employees manage a regional system that includes three major treatment plants, two local treatment plants, as well as pipelines and pump stations that operate 24/7. They plan and design new facilities, regulate the disposal of industrial waste, educate the public and businesses on pollution prevention, and pursue innovation through energy efficiency and by recycling resources to support sustainable communities. Our commitment to quality includes earning Platinum Peak Performance awards from NACWA for consistent permit compliance.

For us, success means clean water and a healthy environment. But it also entails being good stewards of public money, and developing a workplace culture in which employees are encouraged to pursue efficiencies while striving toward larger environmental and organizational goals.

In 2015, the division's management team embarked on an overhaul of the organization's Vision, Mission, Values and Goals. Employees were engaged in this process at every step, taking part in several team brainstorm sessions to share ideas that ultimately shaped our organizational benchmarks.

The vision and goals defined our customer-focused mission to protect public health and enhance the environment by collecting and treating wastewater- while recycling valuable resources for the Puget Sound region and optimizing the energy we use throughout the process. Our employees' voices are reflected in our vision to become an innovative and resilient clean water enterprise revolutionizing the recovery of valuable resources for sustainable communities.

We are now working to "sustain the gain" (ensure that the vision and goals remain visible, understood, and consistently followed) by encouraging supervisors to focus on our values and goals with their team members so employees understand the connection between our mission and their daily work.

One of the ways we accomplish this is through our Bright Ideas program, which encourages innovation through employee-generated ideas (submitted and tracked with an online tool) to increase efficiency and improve work flow and morale. Implemented ideas have resulted in notable improvements in many areas including emergency response, maintenance cost-savings, streamlined processes, investments in more efficient equipment, and better communication. In just two years of the program, employees have submitted almost 1,000 ideas and saved ratepayers over \$750,000.

Continuous Improvement and Lean principles guide our work, empowering employees to identify efficiencies that save money, streamline processes and deliver greater ratepayer value. Through lean principles, employees and managers strive to work more effectively and maximize the value of existing resources.

Over the past two years, Lean has become a priority in our agency's efficiency-driven culture. Almost half of employees have received Lean training, with all supervisors receiving additional coursework in Leader Standard development. As part of our Lean efforts, we conduct workshops where employee teams map processes, measure effort and time, identify barriers and inefficiencies, and make recommended changes that are adjusted as necessary. We are moving toward everyone using Lean tools (such as visual management boards) in their daily work.

Process improvement events have been organized around a number of core work functions, including reducing the amount of time it takes to identify, analyze and select alternatives for capital projects, and reducing the amount of time to acquire needed permits and properties to enable construction to begin. We will continue to evaluate Lean opportunities for budgeting, project management, community relations, capital project approval, and other areas, and continue to look to other successful agencies and companies as examples for our own organization.

We believe performance measurement is fundamental to being a Utility of the Future. In 2015, we developed a new tool to track and measure key division performance metrics to assess what is working and to enable course correction in areas where we're falling short.

Our metrics dashboard is specifically designed around the new Vision, Mission, Values and Goals, and tracks 20 key performance measures identified by management as essential to maintaining a high-performing organization. We continually measure our progress on budget and expenditure levels, employee development and safety, and permit compliance. WTD's management team assesses each metric three times a year, looking at trends, discussing data, and determining any necessary next steps or corrections. We are proud of our environmental record, and the fact that all of our treatment plants have attained 100 percent compliance with effluent limits for the past several years.

WTD has a long history of "recovering resources from wastewater". Our Resource Recovery programs manage the administration and distribution of biosolids, recycled water, and energy. We track our progress on reducing our carbon footprint through renewable energy production and fossil fuel conservation, and finding new markets and innovative uses for our biosolids and recycled water. We are currently doing strategic planning for the four key areas of energy, recycled water, biosolids and technology assessment.

#### Energy

WTD actively employs the "efficiency first" model-while we support and pursue all applicable and viable renewables efforts, we strive first and foremost to use less energy while doing the same job. That model is proven to be the most cost-effective energy management strategy. We track and monitor energy use at our facilities, as well as conduct energy audits and state-of-the-art research to identify opportunities for energy reduction and conservation. For our capital program, we complete an energy analysis on all projects that require more than \$250,000 of energy-consuming equipment, which supports our overall goal to build and operate green facilities.

On the renewables front, waste gas has been powering our raw sewage pump engines at one treatment plant since it came online in 1966. We operate cogeneration systems at two regional treatment plants, producing heat and power for operations, and we produce scrubbed gas and electricity to put back on the grid for two regional energy utilities. The availability, use, and sale of biogas has reduced the amount of energy WTD needs to purchase, and helped us near our goal to become carbon neutral in our operations in 2017, well ahead of our 2025 benchmark.

### Recycled water

We produce about 300 million gallons of high-quality recycled water each year that's used for golf course irrigation, industrial process water and wetland augmentation near salmon spawning habitat. In response to customer interest in recycled water during the severe and historic 2015 drought that put severe stress on King County ecosystems, we entered into new agreements to provide recycled water to the Lake Washington Youth Soccer Association's play fields and local cities for municipal uses. Our recycled water program also supports broader regional environmental goals that entail reducing our long-term need to discharge to Puget Sound, and developing a climate-resilient water resource for warmer than normal years when dwindling snowpack can't adequately fill our streams and reservoirs.

### Loop t biosolids

We beneficially recycle 100% of our biosolids through a land application program that has built a network of customers that use our product to build healthy soils, improve crop yields, and produce lush gardens. Our registered biosolids brand, loop<sup>®</sup>, has been received enthusiastically by the public since its introduction in 2012. The logo's infinity symbol and tagline, "Turn Your Dirt Around", communicated instantly to the public that this is a sustainable product and an environmentally responsible way to manage resources in an urban environment.

An additional benefit of biosolids land application is that it costs approximately half that of drying, combusting or landfilling biosolids. The environmental benefits of our approach reflect our vision of "Revolutionizing the Recovery of Valuable Resources for Sustainable Communities."

### Engaging employees

Finally, workforce development continues to be an important strategy for WTD to maintain experienced staffing levels. Like many utilities nationwide, we have a "graying" workforce with nearly half our current employees eligible for retirement in just seven years. We're keenly focused on developing the next generation of leaders within the organization, in addition to managing a robust recruiting program through partnerships with high schools, colleges and the trades. We are actively working to brand WTD as a "green employer of choice" through job fairs, social media, internship and training opportunities, and public education and outreach that includes under-served communities.

In 2016 and beyond, our utility will maintain its commitment to service excellence by investing in employees, increasing efficiency through lean and Continuous Improvement, meeting or surpassing permit requirements, exploring new technologies and markets for recycled products, and investing in asset management and capital improvement programs.

We are excited to take part in the Utility of the Future certification program, recognizing the value in developing best practices that will take the industry in a progressive new direction, while encouraging greater collaboration and knowledge-sharing. It would be an honor to receive this recognition. Thank you for the opportunity to participate in the program.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities

- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Vision, Mission & Goals: In 2015, WTD's management team updated the division's Vision, Mission, Values and Goals to publicly position our utility as supporting sustainable communities through the creation of resources from wastewater, and to engage employees in carrying out this forward-thinking mission. We started by investigating what other leading edge utilities were doing, identified future challenges and opportunities, and strategized how to be a "Utility of the Future" by engaging frontline employees at every stage of the process through multiple "catchbafl" sessions to get their input and incorporate it in the division's new mission, values and goals. An internal communications campaign is underway to "sustain the gain" and encourage these values to become part of our daily work culture by facilitating regular discussions of a particular value or goal at staff meetings over the next year.

Bright Ideas: WTD's Bright Ideas program encourages innovation through employee-generated ideas (submitted and tracked with an online tool) to increase efficiency and improve the workplace. Implemented ideas have created notable improvements in many areas including emergency response, maintenance cost-savings, streamlined processes, investments in more efficient equipment, and better communication. The results are having a meaningful impact – over the past few years, employee-driven efficiencies have saved utility ratepayers over \$750,000.

*Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
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Delivering major capital projects above \$8 million at least 1 year faster than the benchmark set in 2014.	<p>Project Initiation and Release: Before Lean: 3-6 Months After Lean: Less than 1 month</p> <p>Alternative Development &amp; Selection: Before Lean: 20-26 Months After Lean: 11 Months</p> <p>Design Consultant Procurement : Before Lean: 6 Months After Lean: 5 Months</p> <p>30% Design Document Development: Before Lean: 12 Months After Lean: 9 Months</p> <p>Environmental Permits: Before Lean Create Standard Work After Lean: Standard work will result in more efficient review and approval cycle</p> <p>Real Property Acquisition: Before Lean: 24 Months After Lean: 11 Months</p>
Bright Ideas tracker tool, installed on the desktop of every employee	Total number of submitted ideas: 935 Number of ideas approved: 676 Money saved: \$750,000
Supervisors and employees received training on how to support a work environment of idea sharing and how to proactively engage their employees in sharing ideas at business team meetings.	Received training at All Supervisors Meeting. All supervisors/managers trained in Lean A3 and leadership work 300 employees trained in Lean A3
Bright Ideas training tools were developed to assist employees in successfully navigating the tracking tool, idea submissions and tools for establishing idea-sharing meetings	Received a Training Tool Kit that included ways of promoting idea sharing discussions with their teams and strategies for helping employees become part of the idea implementation
Management Team focused on tracking and removing obstacles to ideas on a regular basis at its Leadership Team meetings.	Ongoing

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Compliance with King County Executive Dow Constantine's Strategic Climate Action Plan that calls for our utility to support ambitious regional goals to cut overall energy usage pursue green building certifications such as LEED and Envision. As a large energy user and producer WTD will be a major contributor to the county's achievement of these goals such as those for reducing normalized energy and producing renewable energy.

Co-funding and participating in state-of-the-art research in partnership with academic institutions, partner agencies and industry foundations focused on significantly reducing the energy demand inherent in current biological nitrogen removal treatment processes.

Capital program's project scoring and prioritization process - energy efficiency incorporated into standard ranking process (using point system to rank in terms of environmental impact)

For all projects installing over \$250,000 of energy-using equipment (total construction cost), perform a resource life-cycle cost analysis on at least two technologies that can meet the programmatic need, and choose the option with the highest net present value, per King County Energy Efficiency Ordinance 16927.

Conduct an annual communications campaign that encourages employees to minimize energy and other resource use at work and at home.

*Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Achieve division-specific carbon neutral operations by 2025 as outlined in King County government's Strategic Climate Action Plan established in 2015.	Currently WTD achieved 92% carbon neutrality in its operations in 2014 and anticipates being carbon neutral by 2017 8 years ahead of the target.
Reduce normalized energy use in facilities 5% by 2020 and 10% by 2025 as compared to a 2014 baseline	Significant ongoing efforts (both capital and operational) to reduce energy consumption at facilities with significant anticipated energy savings. Current analysis shows WTD on track to meet the 2020 goal of 5% reduction in normalized energy. In addition, the WTD normalization calculation methods were revamped in late 2015 to provide greater accuracy and allow tracking of both source and site energy. Past performance: WTD reduced normalized energy by 24% from 2007 to 2015.
Biosolids hauling fleet normalized net energy use reduction of at least 10% by 2020	Currently in the midst of strategic planning process to guide efforts.
By 2025, ensure all electricity supplied to operations is GHG emissions neutral	Currently in the midst of strategic planning process to guide efforts. While some of our electrical suppliers are at or close to carbon neutral, King County is negotiating with others to secure green electricity for WTD facilities.
(Goals from 2007-2015) Reduce normalized facility energy use by 10 percent by 2012 and 15 percent by 2015, as compared to a 2007 baseline	Achieved and surpassed both 2012 and 2015 normalized energy reduction targets.
The Division shall develop an updated energy reduction plan by January 12017. The plan shall be updated at least every five years.	Currently in the midst of strategic planning process to guide efforts



## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

<p>Pursuing engagement with property owners and developers to promote raw sewage heat installations</p> <p>As a large energy user and producer WTD will be a major contributor to the county's achievement of these goals such as those for reducing normalized energy and producing renewable energy. WTD operates a cogeneration facility at its West Point Treatment Plant that produces the energy equivalent of powering 6,000 homes.</p>
<p>WTD preparing to sell RIN from biogas to local transportation fleets, thus increasing use of renewable fuels in the region. WTD will use revenue from the RIN sales to fund additional carbon offsets for any purchased energy used in lieu of biogas.</p> <p>All new facilities over 200 square feet shall be designed in a manner that considers, and as appropriate installs, the basic infrastructure for the future integration of on-site solar power production and storage.</p>
<p>Pursue progress toward the renewable energy consumption target in the following order of priority: 1) energy efficiency projects; 2) cost-effective renewable energy generation projects and 3) renewable and carbon reduction offset purchases.</p>

### *Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Increased renewable energy consumption targets- 70% by 2020 and 85% by 2025	Currently in the midst of strategic planning process to guide efforts
Increased renewable energy production goal	Currently in the midst of strategic planning process to guide efforts
Electricity produced	21.918 million kilowatt hours per year
Methane gas sold	1.825 million therms
Carbon Sequestration	37,263 MtCO <sub>2</sub> e (equivalent of taking 8k cars off the road)
Biomethane put to beneficial use	Striving for 90% at all WTD facilities

## Knoxville Utilities Board TN



### Knoxville Utilities Board TN

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Beneficial Biosolids Reuse

Utility Description(combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Multiple Plants		
Service Area (square miles): 248 (for wastewater system)	Average annual daily flow (MGD): 39.59	
Population Served: 225,000 (for wastewater service)		
Location		
Street Address: 445 South Gay Street		
City: Knoxville State: TN	Zip Code: 37902	
Contact Information		
Name: Billie Jo McCarley	Phone: (865) 558-2926	Email: BillieJo.McCarley@kub.org

**NARRATIVE:** KUB provides electric, natural gas, water, and wastewater services to more than 445,000 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 generations to come.

A corporate strategic planning process completed in 2014 reaffirmed KUB's values, defined measures for success, and initiated an ongoing series of strategic initiatives to maintain focus on priorities, address challenges, and ensure quality in all that KUB does. Strategic initiatives completed or in progress include customer engagement, operational efficiency, revenue growth, emerging technologies, water supply, water loss prevention, and damage prevention. To build on KUB's legacy of environmental responsibility, KUB completed its Environment and Sustainability Strategic Initiative in 2015 to evaluate existing sustainability initiatives and evaluate new opportunities. At the same time, key initiatives for KUB's wastewater system and plants include a Knowledge Management Initiative and development of a water/wastewater operator qualification program. Innovative projects developed from these corporate initiatives include KUB's construction of the first public compressed natural gas fueling station in the Knoxville area, a planned combined heat and power renewable energy system for the Kuwahee wastewater plant, alternative disinfection systems for all wastewater plants, and evaluation of microgrid technologies for KUB's Hoskins Operations Center.

KUB's culture also includes a strong commitment to and engagement with its employees, demonstrated first and foremost through its safety program. The safety of employees and the public is KUB's highest responsibility. With implementation of its Safety Talks and Accident Reduction Training (START) program that engages all employees and members of management, KUB has observed an approximate 20% decrease in overall injuries and 35% decrease in overall Days Away, Restricted, or Transferred (DART) from 2009 to 2015.

In addition to employee engagement in safety, KUB ensures continual communication to align every employee with the shared values and keys to success outlined in the corporate blueprint. Monthly department meetings, company newsletters, electronic message boards, and employee recognition activities help to maintain focus on the blueprint and strategic initiatives and encourage employees to identify new opportunities to fulfill KUB's mission. The workforce development program includes a revitalized leadership development program (LDP). The More than sixty KUB employees have participated in the LDP program. Twenty-five of these employees have had at least one promotion or level advancement and ten have received more than one. All participants in the LDP complete an Individual Development Plan focused on their specific leadership skills and KUB career goals. To date, the retention rate for employees involved in the program is ninety-seven percent.

KUB exists to serve its customers, and does this not only by providing safe, reliable, and affordable utility services, but by participating in the community. Volunteering has always been a cornerstone of KUB, and in 2014, KUB implemented its VolTime policy, which allows every employee eight hours of paid time annually to perform volunteer work in the community. Being a partner to support community priorities is important to KUB and reflected in its wide range of partnerships, including Tennessee Valley Authority and City of Knoxville energy efficiency and sustainability programs, the National Biosolids Partnership, Environmental Protection Agency WaterSense and Natural Gas STAR Methane Challenge, low-income home weatherization programs, and East Tennessee Clean Fuels Coalition initiatives. KUB raises funds to

support United Way through annual campaigns (100% employee-funded) and participates in community events such as Earthfest, Waterfest, River Rescue, Adopt-A-Stream, Adopt-A-Highway, and the Regional Unwanted Medication Collection.

To provide safe, reliable, and affordable services from its four utility systems, KUB continually works to improve assets. KUB, like other utilities nationwide, continues to face the challenge of replacing aging infrastructure. Century II, an infrastructure management program KUB launched in May 2007, is designed to be an investment in our next 100 years of quality service – and in the quality of life in our community. In 2011, KUB’s Board of Commissioners endorsed 10-year funding plans to support work in the water and electric systems, and in 2013, 10-year funding plans were endorsed for the natural gas and wastewater systems. With the proposed level of investment over 10 years and work completed to date, KUB is on track to accomplish sustainable life-cycle replacement programs for all four utility systems.

KUB has maintained an excellent drinking water quality record by staying in compliance with federal and state standards and maintaining its infrastructure. KUB’s distribution system is on a sound replacement cycle, and KUB is implementing a 15-year, \$100 million water plant redundancy plan to eliminate single points of failure and increase operational flexibility. To ensure reliability, the plan includes an additional intake with two independent water sources, emergency electric generators, electric system upgrades, redundant high service transmission mains, additional filters, a redundant backwash process, redundant piping and pumping, and an additional clearwell. Water quality assurance is provided by efforts such as KUB’s assessment program to be aware of businesses and industries upstream of the water plant, and KUB’s state certified lab, which performs over 100,000 tests annually – many more than required by law.

Prior to implementation of the Century II program, KUB’s ten-year PACE 10 (Partners Acting for a Cleaner Environment) program addressed sewer overflows and wastewater system infrastructure improvement to meet increasingly strict regulatory requirements and ensure compliance during peak wet weather flows. PACE 10 began in 2004 and positioned KUB to fulfill requirements of a federal Consent Decree (CD) received in 2005. KUB has upgraded an average of 25 miles of sewer line per year, which represents two percent of the system annually, or a sustainable 50-year replacement cycle. With a total investment of \$650 million, PACE 10 required a transition from spending about a million dollars per month for system improvements to a million dollars a week.

KUB delivered on time and on budget the construction of six wastewater storage tanks and 134 collection system projects required under the CD in 2014, and then rolled the system replacement and maintenance into the Century II program. In 2012 and 2013, KUB completed two of the major plant upgrades and will complete the final two required plant projects by the end of the CD term in 2021. Of KUB’s work, Heather McTeer Toney, EPA Regional Administrator said, “KUB has demonstrated a serious commitment to address its long-standing sewage overflow problems by implementing the Partners Acting for a Cleaner Environment sewer improvement program and meeting major consent decree milestones. KUB’s efforts have resulted in a dramatic 82 percent drop in SSOs between 2003 and 2014...” KUB’s wastewater plants continue to win NACWA Platinum, Gold, or Silver Performance Awards for excellence in operations and compliance with NPDES requirements.

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 at least 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 two 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 22,883 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.

In addition to excellent wastewater treatment performance and the biosolids program, KUB’s commitment to excellence is reflected in awards received for natural gas safety, electric reliability, vegetation management best practices, delivery of sustainability programs, and alternative fuels use and fleet management.

### **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

KUB completed a corporate strategic planning process and blueprint development in 2014 that describes our company’s vision, mission, measures of success, keys to success, and values intended to align each and every employee.

KUB implemented its Century II Infrastructure and Management Program in 2007 to ensure a long-range stewardship perspective over multiple decades. Century II provides sound plans, based on accurate assessments of system condition and performance, and consistent infrastructure funding for KUB’s electric, natural gas, water, and wastewater systems. With this level of investment and work completed to date, KUB is on track to accomplish sustainable life-cycle asset replacement programs for all four utility systems.

KUB completed the implementation of a comprehensive asset and work management system for the efficient deployment, operation, maintenance, and upgrade of utility infrastructure. The implementation involved completing an inventory of utility assets, quantifying the preventive maintenance needs for each, and building work management practices to ensure successful performance of maintenance tasks. KUB continues to evolve use of the system through increased reporting and analysis as well as advanced mobile work order processing and data collection.

In 2008, KUB developed and implemented the Safety Talks and Accident Reduction Training (START) Program to focus on unsafe behaviors and conditions. The START Program encompasses all employees and members of management to engage in Training, Worksite Safety, Correcting Unsafe Behaviors and Conditions, and Rewarding Safe Behaviors and Conditions. KUB has observed an approximate 20% decrease in overall injuries and 35% decrease in overall DART Days from 2009 to 2015.

In 2015, KUB completed an Environment and Sustainability Strategic Initiative to evaluate existing programs, identify new opportunities, and develop a framework for measuring success. A key outcome of the strategic initiative was adoption of a corporate environmental policy in early 2016. Sustainability initiatives for KUB's wastewater treatment plant were also identified, including aeration and chemical optimization.

KUB formed an Environmental Stewardship Department in 2015 to maintain focus on sustainability efforts. A cross-functional environmental team of representatives across the organization was also formed, as well as an environmental initiative recognition program.

KUB raises funds through annual campaigns (100% employee funded) to help United Way fund dozens of partner non-profit agencies. Each year, KUB meets or exceeds its fundraising goal. KUB employees also tour United Way agencies to see first-hand the needs in the community and how their contributions will affect change.

In 2014, KUB implemented its VolTime program. Through the program, employees can spend up to eight hours annually of paid time to volunteer for local non-profit agencies. A benefit of the program is that it can help employees develop an interest in additional volunteer work outside of work.

Since 2005, KUB has offered a TeenWork program, through which area high school students complete internships to learn about utility careers and develop professional and trade skills for their futures.

All appraisers, foreman, crew leaders, supervisors, and members of management complete a training program, "Essentials for Human Resources Management" to ensure consistent leadership practice in the areas of personnel administration, occupational health, safety, employee recognition, performance management, and compensation. This strengthens KUB's strategic focus on investing in a skilled and diverse workforce.

KUB is implementing a 15-year, \$100 million water plant redundancy plan to eliminate single points of failure and increase operational flexibility.

A water/wastewater Operator Qualification program is being developed to ensure that operators are trained and able to demonstrate competency of job knowledge and abilities to operate the KUB wastewater treatment plants. This assists in training new personnel and for succession planning, process consistency, and knowledge management.

A study was completed in 2015 to determine further alternatives for beneficial use of the biogas produced in the anaerobic digesters at the Kuwahee Wastewater Treatment Plant. As a result, KUB plans to install a new Combined Heat and Power system to produce approximately 80% of the energy needed for the plant.

In 2016, facility master plans were developed for long-range asset planning and operations and maintenance process improvements for the future of each plant. These plans encompass all elements of

the plants for the next five to ten years with components intended to look at the long range vision for each plant.

KUB is working to implement alternative disinfection systems for its wastewater treatment plants. The projects will provide safer alternatives to using gaseous chlorine. Non-contact Enaqua UV is currently being piloted at KUB's Fourth Creek Plant, a design report is being drafted for a similar system at the Loves Creek plant, and design for a dry calcium hypochlorite system is in progress for the Eastbridge plant. A pilot project for the Kuwahee plant is planned for the future.

KUB is constructing a public compressed natural gas (CNG) fueling station, due to be open in January 2017. The station will serve KUB's CNG fleet, which is being doubled to 100 vehicles by 2020. With this being the first public CNG station in the Knoxville area, it will make the cleaner burning fuel available to the public with the intent to build community interest and investment in alternative fuels, CNG fleets, and additional stations.

#### *Performance Measures & Results*

- Number of participants in Leadership Development Program (LDP): Thirty-nine employees completed the program in 2014, and twenty-seven employees are enrolled in the 2016 program.
- Number of LDP employees with promotions and/or career level advancements: Twenty-five employees engaged in the LDP have received at least one promotion or level advancement to date and ten have received more than one.
- Number of LDP employees with new assignments or responsibilities: There have been fifty-four additional assignments or responsibilities given to the LDP participants since the program started.
- Percentage of LDP minority participants: The 2014 LDP class include 20% minority participants, and the 2016 class includes 22%.
- LDP employee retention rate: To date, the LDP employee retention rate is 97%.
- Sound Century II financial plan: In 2011, KUB's Board approved 10-year funding plans for the water and electric systems, and 10-year funding plans for the natural gas and wastewater systems were approved in 2013.
- Delivery of Century II infrastructure replacement projects to maintain sustainable life-cycle replacement schedule: Wastewater System:
  - Completed 134 projects and reduced sanitary sewer overflows by 82% since 2003
  - Inspected 1,200 miles of main
  - Built 6 storage tanks
  - Replaced 334 miles of main
  - Upgraded 36 pump stations
  - Replacing 25 miles of pipe/year
  - Initiated a cyclical digester cleaning program
  - Replaced dissolved air flotation solids thickening process with gravity belt thickening process
  - Upgraded and improved grit removal and screening equipment at Kuwahee plant
  - Rebuilt aeration mixers at Loves Creek and Fourth Creek plants

- Replacing all influent pumps and variable frequency drives
- Completed meter modernization pilot program and modernizing all meters over next four years
- Water System:
  - Replacing 14 miles of pipe/year
  - Renewed 7% of system since 2007
  - Reduced galvanized pipe by nearly half
  - Completed meter modernization pilot program and modernizing all meters over next four years
- Electric System:
  - Replacing 2,600 poles/year
  - Replacing 14 miles of direct bury cable/year and all by FY22
  - Rebuilding 16 miles/year of the 69kV system
  - Rebuilding fiber optic cable connections by FY26
  - Modernizing 3 substations/year
  - Completed meter modernization pilot program and modernizing all meters over next four years
- Natural Gas System:
  - Built new South Loop high pressure main for system redundancy
  - Near completion for removal of cast and ductile iron mains
  - Completed meter modernization pilot program and modernizing all meters over next four years
- Water quality excellence: Zero regulatory violations at Mark B. Whitaker Water Plant
- Wastewater treatment performance: For their 2014 performance, three of KUB's four wastewater treatment plants (i.e., Eastbridge, Fourth Creek, and Loves Creek) received Operational Excellence Awards from the Kentucky-Tennessee Water Environment Association (WEA). All four of KUB's plants met the criteria to qualify for 2015 WEA Operational Excellence Awards.
- KUB's plants have also qualified for the following National Association of Clean Water Agencies (NACWA) awards:
  - Kuwahee Plant:
    - 2014 NACWA Silver Award for having less than five NPDES violations.
    - In 2015, the plant performed with no violations, meeting the criteria for a Gold Award (100 % compliance out of 4,787 compliance checks).
  - Eastbridge Plant:
    - 2014 NACWA Platinum Award for five consecutive years with no violations. This was the fifth year Eastbridge earned this award.
    - In 2015, the plant maintained performance to qualify again for a Platinum Award (100% compliance out of 4,299 compliance checks).
  - Loves Creek Plant:
    - 2014 NACWA Gold Award for no violations.
    - In 2015, the plant maintained performance with no violations, meeting the criteria for a Gold Award (100% compliance out of 4,439 compliance checks).
  - Fourth Creek:



- 2014 NACWA Gold Award for no violations.
- In 2015, the plant had one violation, meeting the criteria for a Silver Award (one violation out of 4,299 compliance checks).
- Awards and Recognition
  - NACWA and WEA awards for wastewater plant performance (as listed above)
  - National Biosolids Partnership, Platinum Level since 2011
  - WEA Tennessee Beneficial Use of Biosolids Award, 2014
  - American Public Power Association Reliable Public Power Provider, Diamond Level
  - American Gas Association Safety Achievement Award, Industry Leader in Accident Prevention, 2015
  - Southern Gas Association Community Service Award for TeenWork Program, 2016
  - TVA EnergyRight and Renewable Solutions Top Performer awards
  - Sierra Club Sustainable Energy Leader Award
  - Arbor Day Foundation Tree Line USA award since 2001
  - 100 Best Fleets in the Americas
  - EPA ENERGY STAR for Miller's Building
  - Knoxville News Sentinel Best of Knoxville "Green Business"
- Participation in sustainability partnerships
  - National Biosolids Partnership
  - EPA WaterSense
  - City of Knoxville IBM Smarter Cities Challenge
  - TVA Knoxville Extreme Energy Makeover
  - TVA EnergyRight and Renewable Solutions
  - TVA MainStreet Efficiency Lighting Program
  - Round It Up
  - Georgetown University Energy Prize
  - EPA Natural Gas STAR Methane Challenge
  - East Tennessee Clean Fuels Coalition Tennessee Workplace Charging Partnership
- United Way campaign impact: KUB's 2015 campaign (100% employee funded) raised \$229,277, exceeding the goal of \$200,000.
- VolTime program impact: Since the program began in 2014, 534 employees have participated with 3,620 hours of volunteer time to assist more than 25 agencies in the local community.
- TeenWork program impact: Since the program began in 2005, 365 students have participated. Several participants have returned to work at KUB as college students, and ten current full-time employees were recruited through the program.

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs

- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

KUB achieved Platinum level certification in the National Biosolids Partnership (NBP) in 2011 and has maintained this level of certification to date.

KUB appointed a Biosolids Program Coordinator to manage the environmental management system, ensure process improvement and program quality, and coordinate with the contractor and internal stakeholders.

In 2006, KUB replaced its plate and frame biosolids dewatering system with a new centrifuge process, which reduces chemicals necessary for the process, lowers maintenance costs, and produces biosolids with lower pH levels and no lime. This allows for repeat land application to farms, lowering transportation costs and associated emissions. Without the lime, the product is also less odorous.

KUB implemented a third party contract for operations and maintenance of equipment for the biosolids land application program to ensure quality and adequate resources and staffing. The contractor operates the centrifuge and transports and land applies the product to the fields. In addition, they manage the biosolids permitting process with the state and provide regulatory reporting documentation.

KUB's biosolids product was registered with the Tennessee Department of Agriculture as a fertilizer and is used as an alternative to commercial fertilizers by farmers. On an annual basis, approximately \$900,000 a year of cost savings is realized among the farmers that receive the biosolids.

In addition to application to regional farms, KUB is evaluating alternative solutions for application of the biosolids product. Discussions have been ongoing with the local landfill to determine if they may use the biosolids as a soil amendment to landfill cap material instead of using fertilizers.

KUB completed a solids process control manual that provided a State Point Analysis tool, which will aid in sludge inventory controls, as well as final clarification monitoring. The initial study was completed to further optimize operational strategies for solids management.

KUB developed a website and brochures for the biosolids program, to provide educational information to the public. KUB also established a public mailbox to receive program inquiries and feedback.

KUB produces an annual performance report for the biosolids program, which is provided to the public. It includes results of the program goals and objectives, regulatory updates, any awards obtained by the plant, farmer interviews, and contractor performance results.

KUB developed an internal dashboard that was identified by the NBP third party auditor as an industry best. The dashboard gives operations personnel a visual snapshot of data points coming from the various solids processes. The tool is beneficial for program analysis and decision-making, and operators use the data to monitor and assess plant performance.

KUB participated in a Regional Unwanted Medication Collection event on April 23, 2016, and a KUB representative serves on the Medication Collection team, which normally organizes two to three events each year. A total of 596 pounds of over-the-counter and prescription medications (excluding paper and plastic) were collected and prevented from either going into the wastewater system and associated biosolids or a landfill. This brings the collection effort to over 18,000 pounds of medications since 2008.

### *Performance Measures & Results*

- National Biosolids Partnership certification: Platinum level certification since 2011. Includes two annual internal audits and an annual 3rd party audit of key elements of our program.
- Level of beneficial reuse: 100% beneficial reuse for at least twenty-five years, with a current average of 22,883 wet tons land applied to farms (past applications have included mine reclamation and airport properties).
- Biosolids program awards: KUB received an award from the Tennessee Water Environment Association for Tennessee's Beneficial Use of Biosolids in 2014.
- Value added for biosolids customers: Regional farmers using KUB's biosolids product as an alternative to commercial fertilizers are saving on an annual basis approximately \$900,000. Biosolids are provided to the farmers at no cost. Direct feedback from the farmers indicates they love the product and it saves them money to be used elsewhere in their operations.
- Satisfaction of community and biosolids customers: KUB tracks community feedback, outreach opportunities, and feedback from Post Application Questionnaires from farmers who have biosolids applied to their farms. There have been no complaints about the product and all responses have been positive about the product quality and customer service provided by the contractor. There is more demand for the product than can be supplied.
- Quality Management Practices: As a measure of contractor performance, KUB conducts quarterly assessments of the contractor and the land application process. There have been no non-conformances found in the assessments. KUB has worked closely with the contractor to achieve a positive 20+ year relationship that has provided continuity to the program and a quality end product.
- Internal and Third Party Audits: As a measure of performance, the process of on-going internal audits and third party audits have continued to provide process improvements. There have been no major non-conformances found. The program has maintained its NBP certification and is undergoing a reverification in 2016 on the 5 year cycle.

## *Littleton/Englewood Wastewater Treatment Plant CO*



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### **Littleton/Englewood Wastewater Treatment Plant CO**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type: Single Plant		
Service Area (square miles): 108 mi <sup>2</sup>	Average annual daily flow (MGD): 23.1 MGD (2015)	
Population Served: 300,000		
<b>Location</b>		
Street Address: 2900 South Platte River Drive		
City: Englewood	State: CO	Zip Code: 80110
<b>Contact Information</b>		
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**NARRATIVE:** In addressing challenges in the water industry, the Littleton/Englewood Wastewater Treatment Plant (LEWWTP) has applied various elements of “Effective Utility Management - A Primer for Water and Wastewater Utilities”. Facing challenges in:

- Rising treatment costs;
- Aging infrastructure;
- Increasingly stringent regulatory requirements; and
- A rapidly changing workforce.

LEWWTP is committed to improve our final products, seek strong community support and provide for a sustainable operation. This commitment is demonstrated by the following:

#### Proactive Leadership

Watershed monitoring, research, and protection have been a long-term commitment for the LEWWTP. This is demonstrated through participation and operation of programs with local, regional, and national organizations such as:

- Overseeing a mercury universal waste management program;
- Managing an oil and grease sector control program;
- Continued interaction with regulatory agencies in matters concerning Whole Effluent Toxicity (WET) testing;
- Develop research as needed to evaluate, and model, the impact of nitrate (and other important constituents) in the South Platte River urban watershed;
- Continue collection of chemical and physical information on the South Platte River urban watershed and involvement with the South Platte Coalition for Urban River Evaluation (SPCURE) monitoring program;
- Continued evaluation of the EPA 1631 Mercury analytical protocol.

Since 1988, the L/E WWTP has maintained a Long Range Master Plan, which calls out facility and process expansion, up to the ultimate build-out of the service area. This plan is an invaluable “roadmap” to ensure that facilities and equipment are in place to meet regulatory and treatment capacity requirements.

#### Biosolids

##### Long-Term Biosolids Research

Since 1982, LEWWTP, in cooperation with Colorado State University (CSU) Department of Soil and Crop Sciences, has successfully supported a long-term, continuous biosolids research project. Focused on the

growth of dry-land wheat crops, research data demonstrates the environmentally safe, economically beneficial, and an agriculturally sound practice of biosolids recycling in the arid western United States. In addition to western states farming communities, this research is of value to biosolids researchers, regulators, generators, appliers, and other environmental professionals through the following benefits:

- Understanding of environmental impacts associated with the use of wastewater biosolids;
- Generating key information necessary to the development of improved biosolids regulations and application guidance;
- Promoting public education and increased public acceptability of biosolids recycling;
- Contributing to improved technological design and operation of biosolids programs.

Through improved understanding of the environmental impacts of biosolids use, specific farming and financial benefits are realized. Key information is also generated for the development of enhanced biosolids regulations and program guidance, resulting in greater public acceptability for biosolids recycling.

#### National Biosolids Partnership (NBP)

On July 7, 2011, LEWWTP signed a Letter of Understanding with NBP, in which, LEWWTP committed to become a certified organization with NBP. The intent of this program is to improve its existing biosolids management practices and obtain independent, third party verification. With this action, LEWWTP pledged to meet the national requirements for an excellent biosolids program, to implement and maintain a NBP Biosolids Management Program (BMP), and to follow the NBP National Code of Good Practice. Since that date, the following milestones have been achieved:

- January 15, 2013: Gold Level recognition for successfully completing an independent, third-party verification audit;
- December 4, 2014, L/E WWTP received Platinum level certification with NBP.

In addition to this program recognition, LEWWTP is currently a member of the NBP Advisory Committee and actively involved to mentor the City of Ft. Collins WWTP in their effort to become certified with NBP.

#### Workforce and Leadership Development

An initiative was launched to address performance management, career development, succession planning, and knowledge management to capture the institutional knowledge of its workforce, develop and document Standard Operating Procedures and support on-going training programs to ensure knowledge transfer and long-term operational success. The focus of this plan is the development and use of an online operations manual to capture and store this information.

#### Apprentice Operator Program

In 2000, LEWWTP lost five certified operators and a supervisor to smaller facilities offering attractive pay/benefits packages. This critical circumstance forced management staff to evaluate their recruitment strategy, which had been successfully used for years. Moving away from the standard skills, certification, and “years of experience” approach, a new strategy focused on candidates demonstrating a positive attitude, an aptitude for learning and the intrinsic motivation to learn and advance in the water industry. The result was a change in recruitment strategy from a skill, certification and experience emphasis, to an emphasis on of attitude and aptitude.

This change required an innovative program to train new employees for the skills and operator certification required to be competent plant operators. From this training need, the successful

Apprentice Operator Program was developed and implemented, with the goal of developing “A” certified wastewater plant operators. Since inception of this program in 2000, over 22 individuals have entered the program and over 13 have successfully received their “A” wastewater certifications. Of our current Operations staff, 9 have graduated from this program and 4 are on-track to achieve “A” certification. Other “graduates” have moved to different positions within this facility, moved to other facilities and into the regulatory field for career advancement. This program is so successful, other agencies have asked for our “program blueprint” for their own organizations.

In addition to this development program, several “graduates” of the Apprentice Operator Program have continued their career development through participation in local programs designed to prepare them for managerial positions.

#### Knowledge Management

In conjunction with this Long Range Master Plan, succession planning plays a vital part in retaining institutional knowledge for future workers. We had a program to address a sustainable pool of plant operators, however, we did not have a plan to manage this knowledge, which is about to leave our facility. Plant management recognized the need for an action plan to address capturing this knowledge, (the non-tangible capital) of their senior staff, and ‘who’ will operate and maintain the facility through this period.

#### Innovative Initiatives

Completion of a major construction project in 2009 incorporated many design features that target infrastructure needs and operational sustainability, much with staff contribution:

##### Energy Efficiency

Wastewater treatment can be very energy intensive and process engineering specified energy efficiency where applicable. This was accomplished through the use of variable frequency drives on major pumps to allow for controlled pumping and high efficiency motors on new and existing equipment. Advanced blower controls keep the blower system at its peak efficiency. Since these are the largest motors in the plant, saving a few percentage points can really add up. Electrical design considerations resulted in over \$100,000 in rebates through an energy efficiency rebate program offered by Xcel Energy. Energy management practices resulted in shifting high-demand loads to off-peak periods to reduce cost and shutting off VFD driven equipment not needed for treatment objectives.

##### Electrical System Upgrade

The LEWWTP is supplied electrical feed from two, separate power grids to provide uninterrupted electrical supply, utilizing an Automated Throw-Over switch (ATO) on the incoming power supply. The existing main metering pole (downstream of the ATO) was common to both grids and had previously failed on many occasions, resulting in significant raw sewage spills. The in plant electrical distribution system was upgraded to provide ATO function at each motor control center, allowing removal of the troublesome metering pole, while providing power supply flexibility at each treatment process.

##### Process Automation

Thanks to a modernized data-driven Instrumentation and Control (I&C) system for the facility, control guesswork is being eliminated. Our redesigned, computerized Supervisory Control and Data Acquisition (SCADA) control system conveys detailed information from every pump and instrument in the plant and makes it accessible to operators with just a few mouse clicks. The utility’s I&C system is part of a major

electrical and control retrofit for the LEWWTP. Final design includes a network of programmable controllers and graphic interface stations, interconnected by a fiber optic cable backbone. The system fully automates plant operations, offers configuration flexibility and support real-time maintenance diagnostics and computerized maintenance management, process analysis, alarm paging, operations manuals, and asset management tools.

Thanks to tight integration between the SCADA system and the plant's asset management system, plant staff can browse work history for equipment and create work requests right from the SCADA system. This method reduces the amount of effort it takes to create work requests, reduces and greatly reduces data entry errors.

#### Smart Controls

Smart controls contain built in control algorithms that are meant to optimize energy usage, allowing more efficient operation. These are reflected in:

- Advance boiler controls to maximize usage of biogas from the anaerobic digester process and minimize use of natural gas;
- Smart pump station controller designed and tuned to use the minimum energy possible;
- Advanced process tuning and timing features to turn motors on and off that may run continuously in other facilities;
- Amperage is monitored on almost every motor in the plant to indicate impeller wear, other mechanical problems or pending failures;
- Energy and gas usage monitoring systems that allow continuous monitoring of energy usage.

#### **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Drives an awareness and commitment to workplace safety

Long-range Master Plan

Completely replaced IT server structure to improve system security and reliability

Prepared and presented formal testimony at the 2016 Basic Standards hearing before the Colorado Water Quality Control Commission



We have worked with SPCURE, CWQMC, UWP, and other groups to provide high quality, scientifically and legally defensible chemical and physical information in our watershed.

*Performance Measures & Results*

- Overall safety program performance: Lost time injuries below industry standard
- Apprentice Operator Program: 100% for newly hired Plant Operators

**BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

NBP – Platinum certified

Financial support of long-term biosolids research with Colorado State University

Adequate staffing to support programs

*Performance Measures & Results*

- Maintain 100% distribution of biosolids to beneficial use programs: 100% used in agricultural application
- Monthly compliance with all existing federal, state and local biosolids regulations, and demonstrate performance at least 10% below permit requirements: 100% permit compliance; Monitored metals average 82% below PC limitations
- Financial support of long-term biosolids research with Colorado State University: Annually approved program since 1982

**COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Successfully completed our 2015 World Water Monitoring Challenge and Water Exposition (a public education program with Englewood and area schools)

Plant tours given and feedback requested

Participate in Englewood School District's STEM program

Participate in industry information booth at various public events

### *Performance Measures & Results*

- World Water Monitoring Challenge: conducted annually since 2004
- Send follow-up tour surveys to all scheduled tours of the L/E WWTP - (100%) with 30% return rate; 36 tours given; 33 survey responses received – 92%
- STEM program participation - Started 2015
- Water industry information booth participation - 2 times

### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy Improvement Program implemented by staff

### *Performance Measures & Results*

- Reduce electric energy requirements for wastewater treatment by 2% - Kwh/million gallons influent flow (2012 to 2015): 12.3% reduction
- Process Efficiency program with energy provider (XCEL Energy): Over \$100,000 in provider rebates for energy optimizing/reducing projects since 2006

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel

RFI issued for ways to reuse methane gas produced in anaerobic digesters - 2015

Calculate carbon sequestration through the treatment process – in progress

### *Performance Measures & Results*

- RFI response: 7 responses to evaluate

### **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities

Maintain paper, plastics and metals recycling program

*Performance Measures & Results*

- Recycling program: 100% monthly pick-up

## ***LOTT Clean Water Alliance WA***



### **LOTT Clean Water Alliance WA**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

-  **Organizational Culture**
-  **Beneficial Biosolids Reuse**
-  **Community Partnering & Engagement**
-  **Energy Efficiency**
-  **Energy Generation & Recovery**
-  **Water Reuse**

<b>Utility Description (combine all plants if a multi-site system)</b>		
Type: Regional wastewater treatment and reclaimed water systems		
Service Area (square miles): 81.68 square miles	Average annual daily flow (MGD): 13 MGD	
Population Served: 120,000		
<b>Location</b>		
Street Address: 500 Adams Street NE		
City: Olympia	State: WA	Zip Code: 98501-6911
<b>Contact Information</b>		
Name: Dave Pringle	Phone: (360) 528-5772	Email: davidpringle@lottcleanwater.org

The LOTT Clean Water Alliance operates regional wastewater treatment and reclaimed water systems serving the urban area of north Thurston County, Washington. The LOTT system includes the Budd Inlet Treatment Plant, Budd Inlet Reclaimed Water Plant, Martin Way Reclaimed Water Plant, Hawks Prairie Reclaimed Water Ponds and Recharge Basins, three major pump stations, and related pipe infrastructure. LOTT is governed by four government partners – the cities of Lacey, Olympia, and Tumwater, and Thurston County. LOTT works in coordination with the partner jurisdictions to provide services for treatment and resource production that protect the environment and public health. Beyond daily operations that fulfill our basic mission, LOTT makes the most of our precious and limited resources, preparing our community and organization for the future of wastewater utilities. We exemplify the principles of the Utility of the Future Today through organizational culture, sustainable resource use, and strong community partnerships and engagement.

#### Organizational Culture

In the spirit of innovation, LOTT’s six-year Performance Plan (2013-2018) was developed through an organization-wide effort. In addition to the involvement of the LOTT Board of Directors and senior management staff, every employee in the organization actively participated. The goals, objectives, and supporting activities identified in the plan were staff driven, through a series of Board work sessions, visioning exercises by each of LOTT’s eight work groups, 14 cross-division topic team meetings, ten small team meetings, and a senior management retreat. The result is a plan that is truly a group effort, with broad support and ownership by LOTT staff and Board members.

LOTT commits to internal leadership by cultivating excellence, innovation, mentoring, and knowledge sharing under the Performance Plan goals. The approach involves a proactive effort to ensure that the Senior Leaders are all in-the-know about upcoming projects and issues and that input from staff across the organization can be applied to prevent, respond to, and resolve problems. The team-based management approach is reinforced with numerous cross-division staff teams that plan and evaluate activities and initiatives, such as planning related to capital projects. Teams have also been formed to fill functions that were previously only one person deep, addressing the need to develop succession plans for 100% of critical functions and spreading institutional knowledge across a wider base. The team-based approach across the organization provides open communication and clear accountability.

This approach also requires a variety of professional development opportunities, including an active Career Development Program. Staff members or their supervisors can create custom programs to improve their skills and prepare to advance into a new position or backfill an existing position. Trainings,

courses, conferences, certificates, and more are available for all employees. The team-based approach provides the foundation for future leadership with knowledge across the organization to prepare for retirements, regulatory and operational changes, and demand-based resource production, all under strong financial controls.

#### Sustainable Resources

The team-based approach provides organizational knowledge for a future emphasizing reuse of wastewater resources to support our region. Examples of our efforts:

**Class A Reclaimed Water:** LOTT operates two reclaimed water facilities – a sand filter system and a membrane bioreactor system. Both treat to the state of Washington’s Class A Reclaimed Water standards. Reclaimed Water is currently in use as irrigation at state, city, and port parks; a fountain, pond, demonstration wetland, and interactive wading stream; and toilet flushing in LOTT facilities and at the neighboring Hands On Children’s Museum. LOTT manages wetland ponds and groundwater infiltration basins, and the cities of Lacey and Olympia manage an infiltration facility for water rights mitigation. These uses offset marine discharge into Budd Inlet, a sensitive body at the southern end of Puget Sound, and help reduce groundwater withdrawal regionally. Production, distribution, and use of reclaimed water are the core of LOTT’s long-range Wastewater Resource Management Plan and we anticipate increased use in the years to come.

**Beneficial Biosolids:** 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 and forest lands. For several years, LOTT has captured and converted biosolid methane gas for heat and electricity at its own facility, sharing energy with the neighboring Hands On Children’s Museum. LOTT closely follows research, media, and policy related to biosolids to anticipate regulatory changes and diversify use. To support the development of agricultural resources in Thurston County, a study of the feasibility of a digester project that uses cow manure, food scraps, trap grease, expired beer, and other organic materials to produce biogas is underway. LOTT is a key partner with other local governments and colleges in this study.

**Energy Efficiency:** The LOTT Regional Services Center is a certified LEED platinum building that centralizes staff and operations at the Budd Inlet Treatment plant with lower energy use and sustainable design. Puget Sound Energy, Inc. and Cascade Energy completed an operational energy optimization analysis at the Budd Inlet Treatment Plant in 2015. The analysis provided recommendations for low- and no-cost energy conservation measures, and LOTT instituted many of these before the end of the year. Additional efforts to engage staff and explore additional energy production projects, like solar, and reduction practices are underway to meet the goal of a 5% total energy reduction by 2018.

#### Community Partnering & Engagement

LOTT defines community engagement as “a two-way flow of information and ideas, involving LOTT, ratepayers, members of the public, community groups, partner organizations, staff members, and industry peers.” LOTT works with the public in partnership to educate about operations, conservation, and reuse. Some examples:

**Environmental Studies:** LOTT facilitated a Regional Septic Summit to explore strategies for converting urban density septic systems to the sewer system. Following the summit, the partner jurisdictions

developed a proposed strategy for how to move toward conversion in high risk, high density urban areas. Also, LOTT is conducting a multi-year scientific study on the risks associated with infiltrating reclaimed water to groundwater because of pharmaceuticals and personal care products that may remain in the water after treatment. LOTT formed a Community Advisory Group representing diverse perspectives to inform study efforts and invited regulators and the Squaxin Island Tribe to serve on the study's Science Task Force with staff from our three cities and the county. Results of the study will be shared with the public, and community conversations about acceptable levels of risk will guide future levels of service regarding reclaimed water treatment and uses. This public engagement informs the community on the reclaimed water program, critical to ensure that planned future facilities can be built and used in the service area.

**Local Partnership:** LOTT and the City of Tumwater partnered to co-locate a reclaimed water storage tank and park which resulted in cost savings, construction efficiencies, and other public benefits. The park provides neighborhood open space for the local area, and the storage tank provides the foundation for the park, allowing for a scenic overlook into the Deschutes River Valley. Public art on the tank provides a point of interest and interpretive value for park visitors. The new tank stores up to one million gallons of Class A Reclaimed Water, which allows for irrigation at the Tumwater Valley Golf Course and other sites in the area. Using reclaimed water for irrigation helps save water for other uses and diverts discharge of water into Budd Inlet, reducing nitrogen loading to a sensitive water body. LOTT continues to find joint projects that create new facilities with multiple community benefits, partnering with our government jurisdictions or other community groups.

**Education Program:** At the heart of our community engagement is the education program and WET Science Center. An education facility located in LOTT's certified LEED platinum Regional Services Center, the WET Center has interactive displays that teach visitors about the importance of clean water, the science of wastewater treatment, reclaimed water as a new resource, green design, water conservation, and environmental stewardship. The science center is a popular destination that helps the public understand the complexities of wastewater management and its future. An education partnership with all three local school districts and our committed effort to open the facility to the public ensures access to the community. Additionally, the WET Science Center coordinates with our neighbor and partner, the Hands On Children's Museum (HOCM). Located in downtown Olympia, the WET Center and HOCM provide fun, educational programs for kids of all ages for the south Puget Sound region.

#### Team-based Culture for the Future

The team-based approach connects each member to a culture focused on resource reuse, public engagement, and leadership innovation. Communication and accountability prepare members for new roles and challenges as the industry evolves beyond just treating wastewater. The Performance Plan guides staff as an active management tool, for continuous improvement. It has practical implications for goal setting, accountability, and performance review at the individual, work group, and organizational levels. LOTT is committed to achieve its ambitious goals, to better the organization and more effectively serve our communities as a Utility of the Future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed
  - Establishes an integrated and well-coordinated Senior Leadership Team
  - Provides opportunities to consult with employees in new processes, innovations and designs before building
  - Provides opportunities for employees to find and fix inefficiencies, share ideas for solutions to problems, and participate on project teams
  - Drives an awareness and commitment to workplace safety
  - Maintains attention to employee morale including opportunities to celebrate victories for the utility, and recognize individual accomplishments
  - Established periodic tracking of progress toward meeting goals and milestones
  - Financial sustainability through asset management; long range financial planning

### *Performance Measures & Results*



<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<b>Metric or action to track</b>	<b>Measurement for 2015</b>
<i>Established Senior Leadership Team</i>	Met; Senior Leadership Team meets weekly including executive director, department directors, and HR manager
<i>Established internal communications of supervisors</i>	Met; Maintenance & Operations group meets weekly with supervisors from all departments for project and operations updates and planning and coordination of efforts for the week
<i>Established initiatives that encourage innovation</i>	Ongoing; Energy Conservation Incentives for new ideas. The team has a budget of \$500/quarter to utilize in support of this effort.
<i>Track additional training outside of certification/license requirements</i>	Met; human resources tracks time at trainings, certifications, licensing, classes, and other skill enhancing programs; in process of implementing specific software to track and monitor all training
<i>Have at least 75% of employees attend two team building events per year</i>	Met; staff-led committee events, potlucks, bbqs, happy half hours, All-Staff Meetings, and other group events
<i>Complete project validation for Capital Improvements Plan projects with input and support from key work groups across the organization, including formal business case evaluation (BCEs) for 100% of CIP projects over \$500,000</i>	Met; Business Case Evaluation (BCE) for CIP projects = 100%
<i>Complete an asset management implementation manual in 2015 that established the process for completing asset inventories and assessments</i>	On track; established a process, schedule, and checklist for completing inventories of LOTT's various systems; three systems thoroughly evaluated with 15 in the coming years
<i>Achieve journey-level status and fulfill service commitments for at least 75% of apprentices</i>	Met; Apprenticeships underway = 2 Apprenticeships completed = 0; many over the last 35 years Apprenticeships on track for completion = 2
<i>Provide a variety of professional development opportunities, including an active Career Development Program</i>	Met; Offered a variety of professional development opportunities with three career development plans ongoing and one completed
<i>Identify and develop succession plans for 100% of critical functions</i>	On track; completed hiring to fulfill critical needs identified in staffing plan
<i>Build and maintain culture of safety: Track and report monthly worker hours lost due to injury Track and report safety incidents Achieve state Labor &amp; Industries rating below industry average base rate of 1.0 Conduct at least 1 interjurisdictional and 1 LOTT-specific training exercise annually</i>	Tracking; Time loss = 1  Tracking; Safety incidents = 10 Met; L&I experience rating = 0.6000  Met; Joint training = 1 Met; LOTT training = 1
<i>Develop and implement a comprehensive emergency preparedness program to protect people, environment, and infrastructure</i>	On track to complete comprehensive emergency response plan by 2018, completing at least 1 section of the plan annually
<i>Promote health and wellness of employees as integral to worker safety</i>	Met; Earned WellCity award from Association of Washington Cities annually; earned Gold level Fit-friendly Worksite Award from American Heart Association

<p><i>Have 100% of new employees participate in Mentoring Program; New employees paired with employee outside their department to meet goals for culture of organization; also available for career development, skills training, or ongoing development</i></p>	<p>Met</p>
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**BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Participation in or certification in National Biosolids Partnership or ISO programs

*Performance Measures & Results*

- Maintain level of beneficial reuse of biosolids at 100% Met; biosolids reuse = 100%
- Board directive to explore new, local uses of biosolids Ongoing; Senior staff evaluating other local uses of biosolids
- Competitive bid process for Class B biosolids reuse: Met; contract with agricultural consortium, Boulder Park Inc. and King County, for land application in Douglas County Washington state at rate of \$56.46 per wet ton
- Incorporate biosolids into sustainability and reuse messages: Biosolids reuse is highlighted in education program, website, publications, and WET Science Center exhibits
- Member of ISO program Northwest Biosolids Management Association member

**COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement
- Actively promotes community awareness of the value of water and wastewater and stormwater collection and treatment’s role in the social, economic, public, and environmental health of the community
- Involves stakeholders in the decisions that will affect them, understands what it takes to operate as a “good neighbor,” and positions the utility as a critical asset to the community

- Outreach conducted with other stakeholders and other community groups (e.g., regulators, local officials, watershed groups)

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Metric or action to track</i>	<b>Measurement for 2015</b>
<i>Embrace asset management and use of the triple bottom line (economic, environmental, and social considerations) as the operational standard for all system investment</i>	On track to complete asset management implementation manual for full planning in 2018
<i>Participate annually in at least 5 mission-related events or campaigns in collaboration with city, county, or community partners</i>	Met; collaborative events or campaigns = 13
<i>WET Science Center metrics: Achieve total visits per year equal to or greater than 10% of ratepayer base</i>	Met; Total visits = 14,833 Percent of ratepayer base = 14%
<i>WET Science Center metrics: Achieve and maintain general visitor (walk-in) attendance of at least 400 visitors per month on average</i>	Met; Total walk-in visits = 9,702 Average visits per month = 809
<i>WET Science Center metrics: Host field trips for at least 1 grade level of classes for each of the 3 partner school districts annually</i>	Met; North Thurston Public Schools 7th/8th grade students = 1,291 Olympia School District 6th grade students = 494 Tumwater School District 5th grade students = 294 Additional students = 1,375
<i>WET Science Center metrics: Achieve tour attendance of at least 500 general public visitors annually</i>	Met; Tour participants = 1,023
<i>Implement proactive communication plans for every major project and for issues that have significant public impact</i>	Met; Developed and used communication plans for all major projects/issues; Reclaimed Water Infiltration Study incorporated a Community Advisory Group to facilitate public involvement
<i>Offer at least 3 different opportunities for gathering feedback from the public at any one time</i>	Met; Feedback methods = 8
<i>Provide website access to a video record of LOTT Board meetings</i>	Met; System design and installation completed in 2015, with test recording session at December Board meeting
<i>Provide initial response to public inquiries within 1 business day for 95% of inquiries including social media channels</i>	Met; Inquiries = 877 Initial response in 1 business day = 99%
<i>Achieve 100% compliance with Olympic Region Clean Air Agency (ORCAA) numerical requirements</i>	Met; ORCAA Compliance = 100%
<i>Receive 5 or fewer odor complaints per year</i>	Met; Odor complaints = 2

**ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)

- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)
  - Energy efficiency evaluated for all equipment purchases and capital projects
  - Conduct and or participate in research activities
  - Sub-metering conducted for critical process units
  - Participation in voluntary energy efficiency programs (e.g., Energy Star)
  - Utilization of energy conserving equipment wherever possible (e.g., utilization of peak shaving equipment to reduce usage)

#### *Performance Measures & Results*

- Reduce net overall electrical usage by at least 5% over the 6-year planning period: On track; Completed several energy-saving projects, reducing electrical usage an average of 3.6% in 2015
- Energy optimization analysis for plant processes Met; Puget Sound Energy, Inc. (PSE) and Cascade Energy completed analysis with recommendations for energy savings through PSE Industrial System Optimization Program (ISOP) Met; partnered with Oregon State University for site-specific Energy Efficiency Assessment report
- Establish staff-led energy team to oversee goals and implementation Met; Kill-a-Watt team meets twice monthly to evaluate energy savings Ongoing; staff competition and incentive program to identify more energy saving practices Implement power saving recommendations Met; Installation of Nest pre-set thermostats in individual offices; posters and equipment tags to encourage power savings; installation of light emitting diode (LED) lighting where possible; and programming power-saving modes on plant computers Met; First anoxic mixers automatically shut off after two hours of run time each day; gas mixers now off for 33% of the day Ongoing; multiple small changes in equipment operations

#### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel
  - Co-generation systems
  - Heat recovery systems
  - Mandate sustainable design practices

- Share heat from methane powered co-generation system with neighboring property the Hands On Children's Museum

*Performance Measures & Results*

- Capture and use an average of at least 65% of the available methane and biogas - Met; Methane and biogas reuse = 73.06% Energy generated = 1,987,097 kilowatt hours Energy savings= \$143,071
- Energy optimization analysis for plant processes - Met; Puget Sound Energy, Inc. (PSE) and Cascade Energy completed analysis with recommendations for energy savings through PSE Industrial System Optimization Program (ISOP) Met; partnered with Oregon State University for site-specific Energy Efficiency Assessment report
- Establish staff-led energy team to oversee goals and implementation - Met; Kill-a-Watt team meets twice monthly to evaluate energy savings Ongoing; staff competition to identify more energy saving practices

**WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)
  - Reuse for on-site irrigation, process water (vacuum pumps, seal waters, cooling towers, etc).
  - Reuse off-site for industry, power generation/cooling, golf course irrigation and other uses
  - Development of programs to reduce risk of reuse and improve guaranteed reuse water quality
  - Indirect potable reuse (IPR) for downstream water supplies
  - Steps in communicating to the public the realities of IPR
  - Internal plant methods to insure treated water quality fit-for-purpose reuse

*Performance Measures & Results*

- Protect water resources through high quality wastewater treatment; Report permit compliance monthly and achieve at least 99% compliance - Met; Budd Inlet Plant = 99.18% compliance Martin Way Plant = 100% compliance
- Treat at least 10% of annual average wastewater flow to Class A Reclaimed Water standards - Met; Reclaimed water = 1,660,000 gallons per day Proportion of overall flow = 14.15%
- Class A Reclaimed Water to Hawks Prairie Ponds and Infiltration Site 2015 total = 277,000,000 gallons Daily Average = 760,000 gallons
- Optimize flow reduction to minimize need - On track; Annual flow reduction for 2015 = 41,733 gallons per day for additional capacity; Achieve additional flow reduction of at least 175,000 gallons per day by 2018: Cumulative reduction 2013-2018 = 130,380 gallons per day
- Report permit compliance monthly and achieve at least 99% compliance - Budd Inlet Plant = 99.18% compliance Martin Way Plant = 100% compliance.

## ***Metropolitan Council of Environmental Services – St. Paul MN***



**WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY**

### **Metro Council Environmental Services St. Paul, MN**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

-  **Organizational Culture**
-  **Beneficial Biosolids Reuse**
-  **Community Partnering & Engagement**
-  **Energy Efficiency**
-  **Energy Generation & Recovery**
-  **Water Reuse**
-  **Watershed Stewardship**

Utility Description		
Type: Metropolitan Council is the regional policy-making body, planning agency and provider of essential services for the Twin Cities metropolitan region. The regional includes nearly 3 million people in 7 counties and 182 communities. Metropolitan Council Environmental Services (MCES, a division of the Council, ) maintains about 600 miles of regional interceptor sewer that collect flow from 5,000 miles of sewers owned by 108 communities in the Minneapolis Saint Paul Metropolitan Area. We treat this wastewater at eight treatment plants. We also provide integrated planning to ensure sustainable water quality and water supply for the region.		
Service Area (square miles): 3,00 Sq. miles (entire region)	Average annual daily flow (MGD): 250 MGD	
Population Served: Nearly 3 million (entire region)		
Location		
390 North Robert Street		
Saint Paul	State MN	Zip Code: 55101
Contact Information		
Linda Henning	Phone: (651)-602-1279	Email: linda.henning@metc.state.mn.us

**NARRATIVE:** Minnesota – also known as The Land of 10,000 Lakes - is a special place to live. When you consider all the fresh water in the state and that less than 1% of the planet’s water is usable for humans...many Minnesotans unabashedly claim once again that we are above average in Lake Wobegon.

The Minneapolis-St. Paul metropolitan area (the Twin Cities) is a thriving community of nearly 3 million people in 7 counties and 182 communities, encompassing nearly 3,000 square miles. A strong, diversified economy, excellent education system, and a high quality of life attract people to the region.

### Who We Are

The Metropolitan Council is the regional planning organization for the Twin Cities area. The Council operates the regional bus and rail system, collects and treats wastewater, coordinates regional water resources, plans and helps fund regional parks, and administers federal funds that provide housing opportunities for low- and moderate-income individuals and families. The 17-member Metropolitan Council, whose members are appointed by the Governor, is a policy-making board which has guided the strategic growth of the metro area for nearly 50 years.

### What We Do

Clean water and a clean environment are essential to a healthy life, and the Metropolitan Council is committed to both. Metropolitan Council Environmental Services (MCES,) , a division of the Council, is nationally renowned for its superior work providing wastewater services and also provides integrated planning to ensure sustainable water quality and water supply for the region. .

### Working With Our Partners

Getting the wastewater from the communities we serve to our facilities takes a lot of infrastructure, and collaboration with our customers. We maintain about 600 miles of regional interceptor sewers that collect flow from 5,000 miles of sewers owned by 108 communities. 61 lift stations pump flow to the treatment facilities and 206 metering station help determine communities share of regional costs. We treat this wastewater—about 250 million gallons a day on average—at eight treatment plants, and return it to the environment in compliance with clean water discharge permits, while holding rates 40% below the national average – and significantly reducing purchased energy costs.

Our plants regularly win awards for achieving near-perfect compliance with federal and state discharge standards. The Hastings and St. Croix Valley Plants are two of the top 10 plants in the country for 20-plus consecutive years of full compliance with clean water discharge permits. At our newest facility in East Bethel, the water is treated to almost drinking water purity and then discharged into the ground for groundwater recharge.

With the help of citizen and organizational partners, MCES monitors the water quality of more than 150 lakes, 21 streams and 21 sites on the Mississippi and other major rivers in the metro area each year. In consultation with state agencies, watershed districts, and local governments, we create and maintain an up-to-date regional water supply plan. The plan helps map out water supply trends and options for communities to develop and sustain water supplies

### **The Case for Change**

An initial, and significant, catalyst for change within MCES was the adoption of the Metropolitan Council's regional planning framework for 2040 or *Thrive MSP 2040*. This plan was developed with a high public engagement, and resulted in designated outcomes of Stewardship, Prosperity, Sustainability, Livability and Equity to be achieved by applying principles of Integration, Collaboration and Accountability. Of these outcomes and principles, Sustainability, Integration and Collaboration have all significantly influenced MCES' planning for the future.

Other drivers for change were:

- Climate Change Impacts - Groundwater Recharge Uncertain
- Raised Public Expectations and Resource Constraints
- Going Beyond Traditional Regulation – Flexibility instead of “one size fits all” approach
- Water Resources Utility of the Future needed to improve water quality

### **Strategic Planning Process**

When we began our work on a Strategic Vision Plan, we recognized that we needed to break down our internal “silos” and integrate our work, so we departed from the traditional approach. Rather than develop our plan with a handful of people, we upsized and committed to undertake the efforts by involving many more employees and stakeholders in the process. We used a strategic planning process that was used a visual facilitation process and could involve and engage a large group, which resulted in the recognition that we needed to update our core missions to clarify our role in the regional water cycle and communicate it effectively and we needed to greatly improve the integration and coordination of our work internally and externally with other water stakeholders and organizations. The term “Silos of Excellence” was used to refer to our history of technical excellence, with the acknowledgement that we needed to make better connections between them to work together for greater accomplishments. The new perspective created by the planning team resulted in a change in our mission that now gives greater attention to our water planning roles and captures the “one water” strategy with “integration” for the how and “sustainable” as outcome.

*Old Mission – Provide wastewater service that protect public health and the environment while support regional growth.*

***New Mission – Provide wastewater services and integrated planning to ensure sustainable water quality and water supply for the region.***

We also created a new vision that captures the need to be excellent and efficient at what we do and that we have to earn trust as partner in order to collaborate with other water stakeholders for a sustainable water future.



**MCES Vision – *Be a valued leader and partner in water sustainability.***

Our application addresses seven of the eight Activity Areas included in the Utility of the Future Today Recognition Program. Each is listed below, and includes highlights from our application forms:

**Organizational Culture**

MCES has accomplished or is implementing all of the activities provided as examples and several more. As highlighted in our application forms, MCES included over 60 staff from across the organization in the development of the Strategic Vision Plan. A key takeaway for the group, including some of our most traditional senior managers, was the recognition and acknowledgement that positive results were achieved through this highly collaboration process. This led to the development of business processes that support and hold accountable strategic initiative teams, establishment of a Department of Continuous Improvement to improve CI skills, and establishment of workforce planning activities in which all employees can volunteer to participate. Initiatives and/or teams or networks were also established in the areas of equity, employee engagement surveys, maintaining a respectful workplace, employee wellness and the practice of collaboration both internally and externally to achieve a higher level of engagement. We are still learning to bring process solutions to bear to neutralize two tendencies that “silos,” even excellent ones, can develop. These are tribalism (“we are the experts,”) and tunnel visions that prevents us from appreciating what we don’t know. We firmly believe that the whole will be more than the sum of the parts in our quest to become a Utility of the Future Today.

**Beneficial Biosolids Use**

MCES has completed or is implementing all of the activities provided as examples and several more. We are working to increase our percentage of biosolids use overall and provide specific examples of how we are doing so at three of our treatment plants in a variety of ways. This includes improved pad management practices, evaluating the potential for utilizing the phosphorus-rich incinerator ash and working with a local dairy to divert industrial waste discharge directly to digestion to reduce activated sludge production and increase cake solids.

**Community Partnering and Engagement**

MCES has completed or is implementing all of the activities provided as examples and many more. Our on-going Inflow and Infiltration Program (I/I) Program has been in place for 10 years and was established with a community task force. This has resulted in no consent decrees, no growth moratoriums, no I/I related capacity or storage projects and limited overflows.

MCES is currently undertaking an annual \$100 million Interceptor Rehabilitation Capital Projects program through the implementation of a robust community outreach and communications plan and utilization of a triple bottom line approach.

Another highlighted program, and one that is relatively new, is the Solar Garden Collaboration. In addition to installing solar in some of our facilities, MCES led a competitive procurement process for community solar gardens and invited other public agencies and communities to participate. This program allowed 31 collaborating governments (city, county and agencies,) to support the growth of renewable energy without having to own, operate and maintain their own solar infrastructure, and to take advantage of the economies of scale to do so at a lower cost. The program will provide power equivalent to that required by about 12,000 homes annually.

5 sub-regional water sustainability groups representing 80% of the region and serving the metro area’s 3 million population coordinate water supply, reuse and other water issues. Communities are engaged through a Metro Area Water Advisory Committee and Technical Advisory Committee to guide regional planning for water sustainability for 200+communities.

Other examples provided include our partnership in a Hennepin County U2 Framework designed to improve collaboration on infrastructure investments and construction among public and private entities to minimize disruption and reduce costs to the public. We also provided \$1.5 million for regional water efficiency and regional stormwater reuse grants to encourage watershed districts and communities to invest in community assets, with an emphasis on equity, and reduce demands on groundwater. The grant programs have resulted in the conservation of more than 90 million gallons of water annually.

### **Energy Efficiency**

MCES has completed or have underway all of the standard activities listed, plus several more that are being implemented. We have reduced energy consumption by 260,000 MMBTU/yr since 2006, and leadership has established a goal to reduce fossil fuel based energy purchases by 10% from 2015 to 2020 through both energy reductions and increasing use of renewable energy sources. This is accomplished by partnering with our energy utility, through the work of an internal Energy Team, replacement of facility lighting fixture with more energy efficient fixtures, continued implementation of an aeration efficiency program and many other activities.

### **Energy Generation and Recovery.**

MCES has completed or has underway all of the standard activities listed, plus several more than are being implemented. Leadership has established a goal to reduce fossil fuel based energy purchases by 10% from 2015 to 2020 through both energy reductions and increasing use of renewable energy sources. We are currently participating in solar photovoltaic projects that will generate about 10 MW of solar energy. In addition, steam generated from incineration at Metropolitan Plant, our largest, is used to generate energy or provide heat to buildings. Anerobic digestion added at another of our plants produces gas that replaces 9 million BTUs an hour of natural gas demand, and the future installation of a 1000kW combined heat and power will convert the plant's digester gas to electricity.

### **Water Reuse**

MCES has completed or has underway all of the standard activities listed, plus several more that are planned or being implemented. We currently reuse highly-treated effluent (reclaimed water) from its East Bethel Water Reclamation Facility and since 2014 0.024 mgd has been used to recharge groundwater or augment surface water via subsurface infiltration basins. We are engaged in feasibility studies with water suppliers to develop concepts and costs for wastewater reuse and to move concepts to implementation, and are leading by example by reusing about 8 mgd of wastewater onsite. Another highlight is that MCES is completing a one year or more sampling study to determine the quality of our effluent and underdrain dewatering water in order to evaluate suitability for reuse.

### **Watershed Stewardship**

MCES has completed or has underway all of the standard activities listed, plus several additional that are listed. From 2005-2015, communities in the region completed \$145M in Infill and Infiltration (I/I) mitigation projects in their municipal wastewater collection systems. Also, MCES spent \$88M on I/I mitigation in our own system from 2007-2015 and we plan to make an additional \$72M in mitigation through 2019. Metered flows are showing a downward trend in both base flows and peak hourly flows during wet weather events, and it appears the region will avoid the unnecessary expenses, estimated at \$1.5 Billion to build capacity in the system to handle excess I/I.

The installation of numerous green infrastructure improvements at one of our plants, including a green roof, permeable pavers, infiltration basins and restored wetlands and other features has resulted in the

result of zero run-off from the property during rainfall events of up to five inches over a 24-hour period. This reduction in outflow to the nearby Vermillion River, a state-designated trout stream, has a positive impact on this environmentally sensitive natural resource. The green infrastructure improvements are also being monitored for effectiveness such as green roof temperature, water attenuation, and vegetative species survival; and groundwater flow direction and vegetative species survival of the restored wetland.

MCES’ extensive water quality and quantity monitoring and assessment programs involves the monitoring of 170 lakes, 22 streams that discharge to major rivers, and 22 sits on major rivers. This information allows us to look at development impacts, performance of best management practices installed in the past, and the regional impacts of our eight wastewater treatment plants (the largest point source in the region.)

And finally, and in addition to our existing stormwater grant programs, we are beginning a “one water” green infrastructure pilot program in partnership with a metro area community to look at the wastewater, stormwater and water supply issues together as one system. Activities that could be funded would include inflow and infiltration mitigation, water supply use reduction projects, and/or surface water practices that have multiple benefits.

**ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

<b>Additional Activity Descriptions (OPTIONAL)</b>
Developed a divisional Strategic Vision Plan with participation of approximately 60 staff from across the organization. The strategic visioning process took place over a two year period, and resulted in a new mission, vision, and set of values. In addition, strategies were established, and implementation is underway in many of the areas.
Developed business processes to standardize, support, and hold accountable strategic initiative teams.
Established a Department of Continuous Improvement to develop CI skills across our division and support and track multiple business process improvement activities.
Comprehensive workforce planning activities are taking place, and include the participation from employees in all parts of the organization (an invite to participate was sent to ALL employees). A strategic vision strategy is “to recruit, develop, and retain a high performance workforce that has full opportunity for engagement”. Focus areas of the workforce planning include: managing performance, recognizing and celebrating employees, supporting a positive work culture, building diversity, and enhancing mentoring and onboarding programs.

A MCES Equity Change Team, formed with employees across the division, was established to focus on equity efforts, specific to MCES, its' internal operations, as well as external projects, customers and stakeholders. Much of the team's current work is in the area of educating employees, and assisting with building diversity efforts in the MCES workforce.
Employee engagement surveys are issued every two years. Survey results are used to develop programs and training, in order to better recruit, retain, and engage employees.
Launched a companywide Respectful Workplace Program – that included mandatory training, key messages, and weekly email messages. In addition, bi-annual diversity and management training is mandatory for all managers and supervisors.
MCES has high participation in a Project Management Development Program, with 19 participants in the past 5 years (3% of workforce). In addition, MCES has adopted the use of project management principles on project teams. This program promotes consistency in team dynamics and structure, as well as providing participants with ample training and resources in project management.
MCES is actively pursuing employee wellness programs that promote healthier employees and reduce worksite injuries. Employees have been included in the planning and implementation stages. Some of the programs include piloting a Trade Time for Fitness program and opening a workout room for employees at the Metropolitan Wastewater Treatment Plant.
A 38 member Collaboration Network represents a broad cross-section of departments and disciplines, and includes executives, managers, and staff who have completed training in, or have a stake in the success of, the practice of, collaboration both internally and with external partners. Quarterly meeting agendas include a connection with strategic planning progress and provide opportunities for members to convene, facilitate and/or present portions of the agenda, including sharing their own external or internal field experiences with collaboration. A CN Design Team created a toolbox of resources to support the network members, and a second team of CN members has formed and is actively working on design for employee meetings with MCES General Manager in 2016-2017.
MCES is participating in the Utility Excellence-Tailored Collaboration Project, which is connected to Water Research Foundation's Collaborative Utility Benchmarking in North America Project. This will provide us an opportunity to benchmark our own processes that have strategic priority, to compare our performance with best practices, and to participate in a leading practice workshop later this year with peer utilities.

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Number of OSHA Recordable Incidents by business area</i>	10 of 13 areas have no incidents this year to date
<i>Number of diverse candidates referred to the manager for oral interviews</i>	
<i>100% Compliance with all Permits</i>	4 exceedances to date in 2016
<i>Number of facilities with asset management plans</i>	1
<i>Bi-annual employee engagement survey is issued and job satisfaction, as well as other factors are measured (respect, cooperation, skill match, goal connectedness, growth opportunities, recognition, manager feedback, decision input, value and pride).</i>	MCES response rate in 2013 was 45.4%. The MCES score for "overall job satisfaction" in 2013, was 4.56 on a scale of 1-6. 2015 survey results are in final production.
<i>Collaboration Network- Level of engagement, observation of increased</i>	Attendance at meeting consistently at 70%+, active engagement by all participants is present, and increasing application of

<p><i>practice, and results of member survey of network value.</i></p> <p><i>MCES will select and adopt performance measures through its participation in the AMCV benchmarking project and monitor its progress toward best practices in the industry.</i></p>	<p>collaboration to internal and external meetings with improved results. CN member survey results available in early July.</p>
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**BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

<b>Additional Activity Descriptions (OPTIONAL)</b>
<p>The Empire Wastewater Treatment Plant (WWTP) generates 5% of the total MCES WWTP biosolids, which are digested and land-applied as Class B dewatered cake. Improved pad management practices will reduce land application costs by 25% and increase pad storage capacity by 140%.</p>
<p>The Blue Lake Wastewater Treatment Plant (WWTP) generates 11% of the total MCES WWTP biosolids, which are digested land-applied as Class A pellets.</p>
<p>The Metropolitan Wastewater Treatment Plant (WWTP) processes 75% of the total MCES WWTP biosolids which are incinerated. MCES is evaluating the potential to produce fertilizer using the phosphorus-rich incinerator ash; a recent crop study with the University of Minnesota determined the total fertilizer value of the ash to be \$0.13/lb.</p>
<p>MCES is working with a local dairy to divert the industrial waste discharge directly to digestion to reduce waste activated sludge production by 27% and to increase cake solids by 50%.</p>

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>\$/DT</i>	percent reduction
<i>Total life cycle cost (stewardship)</i>	balanced w/ equity, sustainability, prosperity, & livability
<i>% Biosolids Beneficial Reuse</i>	Increase

## COMMUNITY PARTNERING AND ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

<b>Additional Activity Descriptions (OPTIONAL)</b>
<b>I/I Mitigation:</b> Currently MCES is co-leading and collaborating with an I/I Task Force representing regional cities that is assigned to addressing the technical, political and financial challenges of I/I mitigation from private property sources. For years, MCES has collaborated with communities to establish I/I programs (broader than just that from private sources) that respond to the unique challenges of each city.
<b>Solar Garden Collaboration:</b> MCES Community Solar Gardens on treatment plant buffer land included an opportunity for local government entities to support clean energy and its positive environmental, societal and economic impacts, save on energy bills for public facilities, and hedge against the future price volatility of electricity. In addition, the Community Solar Subscriber Collaborative was a joint effort mostly led by MCES by and for metro area local governments to procure solar garden subscriptions from a single “request for proposals” (RFP) process. The community solar garden program allows government entities to support the growth of renewable energy without having to construct, own, operate and maintain their own solar infrastructure.
<b>Hennepin County UI2 Framework:</b> MCES staff is part of a collaborative process in Hennepin County aimed to maximize collaboration on infrastructure investments and minimize disruption to the public. This framework will collect mapped data from local, county, state and regional agencies, as well as private utilities. The UI2 tool will be instrumental in helping owners of infrastructure located in the public rights of way better plan and collaborate on construction projects in the best interest of the public.
<b>Interceptor Rehabilitation Capital Projects:</b> MCES engages regional communities, county and state transportation agencies to plan and implement its interceptor rehabilitation capital program. MCES is currently undertaking about \$100M annually in interceptor rehabilitation work, and has developed a robust community outreach and communication plan for every project. MCES uses the triple bottom line approach, and works through agreements with communities to restore community infrastructure disturbed by its projects, including parks, trails, streets, etc., restored to a better condition than what existed prior to the project.
<b>Customer Forums:</b> Annually, MCES holds multiple customer meetings (with our 109 directly served municipalities and industrial customers) to share information about rates, levels of service, strategic initiatives and our capital program. . Engaging with customers on formally stated levels of service, including a “good neighbor” measure to ensure high quality interactions and coordination on our \$100M+/yr capital program. Multiple customer forums per year sharing information on financials, strategies, outcomes and getting input from stakeholders. Participation in planning with neighborhood groups/stakeholders to create regional policies and strategies for sustainable water supplies.
<b>Individual Customer Meetings:</b> Each year, MCES staff meets with individual community representatives to discuss rates, planned capital projects, new initiatives or concerns about service delivery. These meetings have been well received by customer communities and have been a venue for improved communication between MCES and its customers.
<b>MCES Capital Programs Communication Plan:</b> MCES has developed an interceptor project communication program that is implemented consistently on its capital projects. The plan sets standard templates for written

materials, website postings, maps, establishes links to city websites, establishes links to county and state transportation.
<b>Statewide Water Summit</b> – lead with 5 state agencies and governor’s staff, set agenda for water investment regionally and statewide for the next 3 years.
Active in newly formed <b>Minnesota Sustainable Growth Coalition</b> , an innovative public/private sector partnership focused on energy, food and water sustainability for statewide economic competitiveness through circular economy principles. MCES is working with fortune 500 companies as a sponsor and participant to implement water sustainability practices in public and private sectors.
<b>MN Technology Assistance Program</b> (MNTAP) collaboration helps state university, MCES and private sector industry conserve water resources to reduce aquifer demand, use less energy, and decrease pressure on wastewater system capacity, ultimately saving dollars and water resources regionally.
<b>\$500,000 Regional water efficiency grant program</b> partners with communities to incentivize household water use reduction through high efficiency fixture and irrigation replacements. \$1M regional stormwater reuse grant program incentivizes collaboration between watershed organizations and cities to invest in community recreational and educational assets, with an emphasis on equity, while reducing demand on groundwater using green infrastructure and stormwater (re)use systems.
<b>5 subregional water sustainability groups</b> serving the 3 million population region coordinate water reuse, groundwater recharge and other water supply, stormwater use and wastewater reuse opportunities. Active engagement through a formal regional Metropolitan Area Water Supply Advisory Committee (policy setting) and Technology Advisory Committee to guide regional planning for water sustainability. Adopted regional water resources planning policy emphasizing triple bottom line for investments in terms of sustainability, prosperity, equity, livability, and stewardship through integration, collaboration and accountability for 200+ communities representing over 3M residents.
<b>Energy and Sustainability Collaboration:</b> MCES participates (and leads for the Met. Council) many environmental groups in this area including the Metro Energy Coalition (with metro counties and the metro airport commission), the state Environmental Quality Board (several state agencies and citizen reps), 3 other agency (mostly state agencies) teams (Environment and Climate, Interagency Pollution Prevention Advisory Team, Interagency Climate Adaptation Team), and Clean Air Minnesota (a public private coalition focused on air quality criteria pollutants). Within the Met. Council we lead an interdivisional (including transit and transit planning; community development, parks, housing) Climate Change and Environmental Sustainability Team and were a founding member of the Climate Registry (and still report all our GHG emissions). We also work with, help and collaborate with the University of Minnesota, the state Science Museum and many in Minnesota’s rich non-profit community (among them: the Environmental Initiative, Great Plains Institute, Fresh Energy, Community Energy Resource Teams, District Energy). An example is the nation-leading e21 initiative to improve the business model for Investor Owned Utilities in the 21 <sup>st</sup> century given disruptive changes such as accelerating conservation, distributed generation, EV and smart grid appliance adoption.
<b>One-water collaboration:</b> MCES staff participate in many organizations, local and national working in this space. Among these are our water monitoring work with the Minnesota Pollution Control Agency and citizen volunteers , NACWA, WERF, CSWEA, US Water Alliance, metro Watershed District organizations, the Minnesota Clean Water Funds’ Interagency Coordinating team, Minnesota Headwaters Fund Advisory Council (working for source protection). Right now, we have staff working on leading conferences for the national APWA, Central States Water Environment Association (CSWEA), Minnesota Water Resources Conference, and the Joint Minnesota Wastewater Operators/CSWEA innovations Conference. .

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Improve customer service and outreach during interceptor rehabilitation projects through implementation of a communication plan</i>	<ul style="list-style-type: none"> <li>• MCES currently has 28 projects listed on its website with 6000 subscribers to GovDelivery (a electronic subscription service for newsletter delivery)</li> <li>• MCES conducts project open houses during the design, and preconstruction phases on the project. Attendance numbers vary based on the neighborhood disturbed, but can range from 7 -80 people.</li> </ul>

	<ul style="list-style-type: none"> <li>• Each interceptor rehabilitation project has a project hotline; performance goal is that callers receive a response within 24 hours of leaving a message.</li> <li>• At the completion of every interceptor project, communications received from the public from the project hotline or website are analyzed so that improvements can be made in the project delivery.</li> </ul>
<i>Improve customer service by sharing budget information with customers at a forum.</i>	MCES conducted three budget forums with a combined total of 68 attendees.
<i>Interceptor rehabilitation projects are completed in cooperation with regional cities.</i>	Currently, 30 projects are under construction – all which are being done in collaboration with local communities.
<i>MCES collaborates with cities in developing solar gardens as sustainable energy sources.</i>	MCES leads a cooperative partnership to build solar gardens that now serve dozens of communities. Solar gardens will provide enough power equivalent to 12,000 typical homes energy usage per year.
<i>Gallons of water conserved</i>	95,000,000 plus \$500K annual water efficiency incentive grant program
<i>Regional Engagement</i>	80% of region represented by sub-regional water supply sustainability groups composed of local officials and staff.
	.
<i>Energy Collaborations and our work in this space</i>	Reduced energy by about 23% since 2007 which translates to over \$4 million savings per year for our ratepayers.
<i>Number and type of specific projects completed associated with a partnership</i>	MCES, in partnership with sub-regional water supply work groups and agency partners, has completed several planning-level engineering and technical studies related to regional water supply issues: 15 have been completed since 2010.
<i>Number of ongoing communications network actions/activities</i>	MCES recorded 20,750 visits to the wastewater treatment portion of the Council’s website in 2015. In addition, MCES recorded approximately 600 visitors/month to the water supply planning portion of the website in 2016.
<i>Type and number of working agreements and collaborative initiatives for growth planning between and among different levels of government</i>	<p>MCES participates in 9 collaborative initiatives for regional water supply and growth planning: MN Interagency Coordination Team, Metropolitan Area Water Supply Advisory Committee (MAWSAC), Water Supply Technical Advisory Committee (WSTAC), and 6 sub-regional water supply work groups.</p> <p><b>Highlight:</b> To develop the Master Water Supply Plan, stakeholders were engaged through:</p> <ul style="list-style-type: none"> <li>• MAWSAC presentations and discussion</li> <li>• WSTAC presentations and discussion</li> <li>• Public meetings during plan development (over 260 attendees representing more than 75 communities)</li> <li>• Ad hoc community meetings during plan development (45 attendees representing over 32 communities)</li> <li>• One-on-one discussions, including data sharing, between Council staff and community planning and utility staff during plan development (over 90 public water suppliers)</li> </ul>



	<ul style="list-style-type: none"> <li>• Information shared on the Council’s website</li> <li>• Formal public review period and process</li> </ul> <p>Overall, the communities participating in Master Water Supply Plan outreach serve over 85% of the metropolitan area’s population.</p>
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## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

<b>Additional Activity Descriptions (OPTIONAL)</b>
MCES management established goal to reduce MCES fossil fuel based energy purchases by 10% between 2015 and 2020. (To achieve this goal, MCES includes the renewable energy generated onsite at our facilities, as well as energy reduction measures.)
MCES internal Energy Team promotes and coordinates energy efficiency measures between departments and plans staff training events. This team prepares annual energy performance reports
MCES partners with its power utility, Xcel Energy, to identify energy savings opportunities and verify savings from implemented changes. Energy savings opportunities are identified through lighting, recommissioning, and compressed air energy efficiency studies and the 2014 MCES Energy Master Plan.
Facility relighting with more-energy efficient fixtures throughout has saved 10,300 MMBTUs annually. Replaced lighting in over 2 (?) miles of underground tunnels saving 6,646 MMBTU of electrical power
MCES is implementing an enterprise-wide Energy Management System to manage facility power consumption. Thirty one sub-meters have been installed at the Empire Wastewater Treatment Plant to monitor critical processes.
MCES’s ongoing aeration efficiency program, which includes optimization of dissolved oxygen set points, reduced system pressure, and diffuser maintenance, saves about 100,000 MMBTU annually.
Reduced electrical energy for aeration process by 15% over the past 10 years
Replacing thickening centrifuges with belt filter presses at a 22 MGD facility

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
MMBTU/yr	MCES has reduced energy consumption by 160,000 MMBTU/yr since 2006. (An additional 70,000 MMBTU of renewable energy generation is included in MCES communication of its reduced consumption of fossil fuel based energy.)
<i>\$/yr saved through energy efficiency implementation</i>	
<i>Energy Star Rating (specific to wastewater treatment facilities.)</i>	

## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

<b>Additional Activity Descriptions (OPTIONAL)</b>	
MCES management established a goal of advancing renewable energy in the Twin Cities metropolitan area equivalent to 10% of MCES fossil fuel based energy purchases in 2015 by 2020. We are currently participating in solar photovoltaic projects that will generate about 10MW of solar energy on MCES-owned land. Through a local government collaborative, MCES will be participating in about 6MW of solar energy generated on sites not owned by the Council.	
The Metro Plant produces steam from sludge incineration. Steam is used to generate electricity or provide heat to plant buildings. When the objective is power generation, a 4.7 MW condensing steam turbine is used and when the objective is building heat, the steam passes through a 0.83 MW non-condensing turbine generator, before being distributed throughout the plant.	
MCES added anaerobic digestion at the Blue Lake Wastewater Treatment Plant in 2012. Digester gas replaces 9 million BTU/hour of natural gas demand.	
Current project under design at the Empire Wastewater Treatment Plant to install a 1000 kW combined heat and power (CHP) engine. The CHP engine will convert the plant's digester gas to electricity (equivalent to 1/3 of the plant's total power demand) and heat (equivalent to 40% of the plant's heat demand).	
In Collaboration with a local district energy company, MCES is evaluating a neighborhood district energy/cooling system that recovers heat from sewage.	
Approximately 90% of biosolids are source of renewable energy (steam, electricity, biogas)	
In process of installing Combined Heat and Power generator to further utilize digester biogas	
<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>MW renewable energy advancement in the region by MCES</i>	MCES is committed to participating in solar projects that will generate energy equivalent to about 10% of MCES total energy usage.
<i>MMBTU/yr of energy generation</i>	In 2015, MCES generated 61 MMBTU of energy from its turbines.

## WATER REUSE

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented

- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

<b>Additional Activity Descriptions (OPTIONAL)</b>
MCES currently reuses highly treated effluent (reclaimed water) from its East Bethel Water Reclamation Facility. Since 2014, 0.024 mgd of effluent from this WRF has been used to recharge groundwater and augment surface water via subsurface infiltration basins.
MCES is actively working to develop wastewater reuse projects that will reduce use of groundwater & reserve high-quality groundwater sources for drinking water supply. We are engaged in feasibility studies with water suppliers in the region to develop concepts and costs for wastewater reuse and move those concepts to implementation.
MCES is currently leading by example by reusing its WWTP effluent onsite, thereby reducing use of groundwater aquifers. MCES currently reuses approximately 8 mgd of WWTP effluent for cooling, scrubbers, tank washing, etc. The goal of an ongoing initiative is to implement further reuse opportunities as discussed below.
Using in-house laboratory capacity supplemented, as needed, with external assistance, MCES is completing a 1+ year sampling program to determine the quality of its WWTP effluent and underdrain dewatering water in order to evaluate potential suitability for reuse.
MCES is participating in a statewide interagency work group developing recommendations for changes to regulations that would better support reuse (wastewater, storm water, and shallow groundwater)
MCES completed a conceptual level study to evaluate the potential for using reclaimed water to augment a high-value lake experiencing significant lake level decline.
MCES is in the process of starting a “one water” community green infrastructure pilot program which will help one community in the Twin Cities metro area look at their wastewater, storm water and water supply issues together to deploy integrated solutions with measurable results. Actual improvements will be funded which could include such activities as inflow and infiltration reduction projects, water supply, reduction projects or surface water practices that serve multiple benefits.
MCES is in a unique position in that we work with all 187 local units of government in the metro area on their comprehensive plans, which include chapters on local water supply systems, efforts and practices, local wastewater infrastructure and needs, and local storm water planning and management activities, We have review authority over these plans. Long term advocacy for locally relevant best practices has resulted in a cycle of positive, recognized progress through partnerships.

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Reduce non-potable use of groundwater; reserve high-quality groundwater source for drinking water supply</i>	Planned additional reuse of plant effluent onsite at WWTPs will reduce groundwater use by an additional 3 mgd (approx. 40% reduction in groundwater use)
<i>Recharge aquifers &amp; augment surface water bodies</i>	Recharging aquifer and augmenting surface water body with 0.024 mgd reclaimed water; modeling impacts of potential recharge using reclaimed water from MCES WWTPs in other parts of Twin Cities area
<i>Reuse high quality shallow groundwater for offsite irrigation rather than discharge with plant effluent; reduce drinking water aquifer use for irrigation</i>	Use of 1 mgd of shallow groundwater from WWTP underdrain dewatering system for offsite irrigation will reuse a high quality water source that currently is discharged without use. It will also reduce non-potable use of drinking water aquifer supply.
<i>Develop programs to reduce risk of reuse and improve guaranteed reuse water quality</i>	Initiate a project to quantify reclaimed water TDS impacts on irrigation; determine potential for source control to reduce reclaimed water TDS concentration by 20% which would potentially eliminate the need for reverse osmosis treatment for reclaimed water production for irrigation.

## WATERSHED STEWARDSHIP

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

<b>Additional Activity Descriptions (OPTIONAL)</b>
We currently are funding innovative, demonstrable and educational stormwater practices through a grant program. The grant program will both assist in getting more innovative practices on the ground and will promote the projects as demonstrations of sustainable water resources management. Practices with multiple benefits such as reuse, infiltration of storm water to groundwater systems, and social equity benefits and public engagement are incentivized.
We are in the process of starting a “one water” community green infrastructure pilot program which will help one community in the Twin Cities Metro Area look at their wastewater, storm water and water supply issues together as one system to deploy integrated solutions with measurable results. Actual improvements will be funded which could include such activities such as inflow and infiltration reduction projects, water supply reduction projects, or surface water practices that serve multiple benefits.
Our Empire Wastewater Treatment Plant is a leading example of a facility using green infrastructure to protect water resources and meet water sustainability goals. It includes a green (vegetated) roof, pervious pavement, rain gardens and infiltration basins and serves as a demonstration site for neighboring communities. Streambank restoration and natural riparian habitat restoration with native plants has also occurred on this site, as well as restoration of a 50-acre wet meadow wetland.
MCES is in a unique position in that we work with all 187 local units of government in the metro area on their comprehensive plans, which include chapters on local water supply systems, efforts and practices, local wastewater infrastructure and needs, and local storm water planning and management activities. We have review authority over these plans. Long term advocacy for locally relevant best practices has results in a cycle of positive, recognized progress through partnerships.
MCES also has an extensive regional water quality and quantity monitoring and assessment program. Each year MCES and local partners monitor over 170 lakes in the region, 22 streams that discharge to our major rivers, and 22 sites on the major rivers. This information allows us to look at impacts of development, the performance of best management practices installed over the years and regional impacts of our 8 water resource reclamation facilities (the largest point source in the region).
Finally, MCES was very proactive and forward thinking when it came to wastewater infrastructure. We separated our combined sewers serving roughly 1 million people years ago so we do not have CSO issues. This has allowed us to focus on other nonpoint source improvements, projects and studies over the years, and maintain utility rates below the national average for utilities our size.

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Reduction in wet weather impacts</i>	No combined sewer overflows in last 10 years
<i>Inflow and infiltration mitigation</i>	From 2005-2015 communities in the region completed \$145M in I/I mitigation projects in their municipal wastewater collection systems. Also, the Metropolitan Council spent \$88M on I/I mitigation in its own system from 2007-2015 and plans to spend an additional \$72 M through 2019. Metered flows are showing a downward trend in both base flow and peak hourly flows during wet weather events, and it appears that the region will avoid the unnecessary expense, estimated at \$1-2 billion, to build excess capacity in the system to handle excess I/I.
<i>Reduction in storm water runoff from our Empire WWTP</i>	No storm water discharge from the Empire WWTP since installation of green infrastructure (green roof, infiltration basins, pervious pavers, etc). Green infrastructure has been observed after rainfalls exceeding 5 inches in 24 hours, with no surface outflow to the nearby Vermillion River, a Minnesota state designated trout stream.
<i>Collection of data to verify effectiveness of green infrastructure at Empire WWTP</i>	Instrumentation has been installed within numerous green infrastructure practices to collect data on effectiveness, which will be shared with state and local partners. Data is being collected on the following metrics: green roof temperature, green roof water attenuation, green roof vegetative species survival, infiltration basin draw-down rate, measure of groundwater flow direction, restored wetland vegetative species identification and survival rate.
Support for best management practices in the region	Over \$17 million dollars awarded through 3 grant programs – TCQI, MEP and Targeted Storm Water
Phosphorus Umbrella Permit Performance	Shared credits allowed a partner utility to implement green infrastructure to meet phosphorus limits
Measuring water quality of area lakes, rivers and streams	Monitor over 170 lakes a year, 22 stream sites and 22 river sites

## ***Metro Vancouver Liquid Waste Services BC***



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### **Metro Vancouver Liquid Waste Services BC**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Metro Vancouver's Liquid Waste Services Department owns and operates 5 wastewater treatment facilities, 33 pump stations, over 500 km of trunk sewers and support facilities, providing services to a population of about 2.5 million.		
Service Area (square miles): 1,111	Average annual daily flow (MGD): 319	
Population Served: 2.5 million		
<b>Location</b>		
Street Address: 4330 Kingsway		
City: Burnaby	State: B.C.	County: Canada
		Zip Code: V5H 4G8
<b>Contact Information</b>		
Name: Simon So	Phone: 604 432-6479	Email: simon.so@metrovancover.org

**NARRATIVE:** United as a partnership of 21 municipalities, one Electoral Area and one Treaty First Nation, Metro Vancouver collaboratively plans for and delivers regional-scale services. Metro Vancouver is governed by a Board of Directors of elected officials from each local authority. The mandate of the Board includes liquid waste management as one of Metro Vancouver's core services.

Metro Vancouver is the third most populous metropolitan area in Canada at nearly 2.5 million and is home to some of the fastest growing communities in the country. Along with the ever-increasing demand for service and continually changing regulatory requirements, Metro Vancouver is challenged with planning, designing, building, operating and maintaining five wastewater facilities, 33 pump stations and over 500 kilometres of sewage collection works. The challenges provide ideal opportunities for improving operational efficiency, protecting public health and the environment, as well as implementing the best available technologies for resource recovery to address climate change and sustainability in our current and future facilities. The organizational culture of Metro Vancouver's Liquid Waste Services Department is centered on a statement in its Integrated Liquid Waste and Resource Management Plan:

"All elements of liquid waste will be efficiently recovered as energy, nutrients, water or other useable material, or returned to the environment as part of the hydrologic cycle in a way that protects public health and the environment."

With two brand new treatment facilities to design and build within the next 15 years, Metro Vancouver is aggressively exploring innovative options to build the Utility of the Future that encompasses the desired elements of effective water quality solutions, energy efficiency and production, water conservation and reuse, nutrients and materials recovery, climate change and adaptive management, asset management, risk mitigation and resiliency, as well as financial stability and staff leadership development.

To ensure attention is paid to exploring solutions in creating the Utility of the Future, the Department:

- Has created distinct research programs with dedicated staff to brain-storm and evaluate possible solutions in collaboration with universities, vendors, and research organizations;
- Has established a wastewater research centre to enable research and testing of emerging wastewater technologies and engaging the public as a place for learning;
- Encourages staff to submit proposals to fund ideas that enhance departmental sustainability and innovation on an annual basis;
- Has established financial reserves for the specific purpose of funding innovative sustainability proposals;

- Promotes staff development through required training such as safety, as well as optional offerings such as the Engineer-In-Training, Mentorship, and Apprenticeship programs, Corporate Development Fund to provide financial assistance towards a diploma or degree, and other successional planning activities.

This application includes Activity Area 1: Organizational Culture, plus the following:

- Area 2: Beneficial use of Biosolids – results of a number of land reclamation and fertilization activities are described, as well as evaluation of the use of biosolids to help reduce greenhouse gas (GHG) emissions from landfills and the use of waste heat to dry biosolids for use as a coal replacement fuel or fertilizer;
- Area 3: Community Partnering & Engagement – highlights community engagement activities (e.g., face-to-face and social media) that helped conceptualize a major piece of the utility of the future, specifically, the Lions Gate water resource recovery facility. The Lions Gate facility will have significant indoor and outdoor public gathering spaces for displaying public art and running education programs, in addition to rooftop viewing of Vancouver’s inner harbor and cityscape;
- Area 4: Energy Efficiency – a number of activities are described from the adoption of policies on energy management and green buildings, to the continual development and use of an Energy Management System, to the completion of energy audits and projects that save energy, reduce GHGs, and lower costs are identified;
- Area 5: Energy Generation & Recovery – the results of existing biogas production, combined heat and power generation facilities, and CO2 reduction initiatives of Metro Vancouver’s Climate Action Plan are described, as well as planned upgrades for additional energy generation and sewage heat recovery. The proposal to contribute \$4 million towards a sludge-to-biocrude pilot project is also included in this section.

Collectively, this application provides insight into Metro Vancouver Liquid Waste Services Department’s current activities to help build the desired Utility of the Future. Metro Vancouver’s leadership team is continually examining additional programs and activities that can help accelerate and further engage internal and external stakeholders in building that better future for the communities served.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Created a distinct research and innovation program with a dedicated team within Metro Vancouver Liquid Waste Services (LWS). This enables LWS to assess emerging technologies to establish a technology roadmap towards a vision of the Utility of the Future. The team is empowered to imagine,



create, test and implement innovative approaches to liquid waste collection and treatment. Universities, emerging technology vendors, and organizations such as the Water Environment & Reuse Foundation are engaged to formulate and execute research and development projects designed to address a target problem or opportunity.

Established the Annacis Research Centre (ARC), a facility for wastewater research, pilot-testing, learning and community outreach. ARC signifies Metro Vancouver's commitment to cultivating a culture of partnerships with academic organizations and working with industry technologists and vendors to continually explore operational improvements.

Established a "Sustainability Innovation Fund" (SIF) which is a CAD \$10 million reserved fund with an annual contribution of \$1.1 million to fund innovative project proposals of merit. Several higher risk projects that push the envelope of innovation have been reviewed by Metro Vancouver's Climate Action Committee and approved by the Board. The process is designed to engage the workforce and promote imagination, creation, testing and implementation of innovative solutions to real-world problems.

Top-down and bottom-up strategic plans:

- The Metro Vancouver Board develops a Strategic Plan covering the term of the Board. The current 2015 – 2018 Strategic Plan includes the following strategic priorities: i) integrated liquid waste and resource management, ii) resilience, iii) public education
- The Liquid Waste Services Department annually adopts a Strategic Business Improvement Plan. Strategic priorities for 2016 include: succession planning; decision-making processes; communications strategy; Asset/System Data Management; Information Technology Strategic Plan; Contaminants of Emerging Concern.

Training initiatives in-place include: i) Engineer-In-Training (EIT) Program, ii) Technical Training and Procedures Program, iii) Mentorship Program, iv) Corporate Development Fund, v) Corporate Training Courses, vi) Apprenticeship Program. These programs encourage recruitment, training and development of future leaders to gain experience and knowledge of Metro Vancouver Systems, as well as, the capture and transfer of skills from current staff to future workers, ensuring successional competencies.

#### *Performance Measures & Results*

- Number of EITs achieving P.Eng. status: 13 of 20 since 2009
- Number of mentorships established: 70 since 2009
- Supervisory development courses: 45 per year
- Departmental Strategic Planning Sessions: All employees, once a year
- Number of current innovations research collaborations : With universities: 9
- With Water Environment & Reuse Foundation: 5
- With emerging technology vendors: 4
- Completion of stated actions in strategic plans: Varies; too many examples to list

#### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs

- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Biosolids use for capture of fugitive methane in landfill Methane Oxidation Beds (MOBs)

In 2011 Metro Vancouver partnered with another Regional District to install and monitor MOBs as part of the closure of 4 landfills. MOBs (also called biofilters) are enclosed areas located above landfill gas hotspots that are filled with a compost (fabricated using Metro Vancouver biosolids and woodchips) that fosters the growth of methanotrophic bacteria which transform landfill methane into carbon dioxide, a much less potent greenhouse gas. The MOBs were monitored to determine the reduction in methane and the results from the study showed an 80-100% reduction in methane emissions, depending on the season.

GHG emission Reduction Calculator for Landfill Biocovers:

Metro Vancouver is collaborating with another Regional District on a biocover trial to demonstrate and quantify methane reduction in landfill gas from biosolids-containing biocovers. Metro Vancouver will provide biosolids, expertise and partial funding for the project, which will develop a GHG emission reduction calculator in conjunction with the provincial body responsible for climate action. The development of this calculator is intended to promote the use of biosolids-containing biocovers for landfill closure by smaller landfills that are not required to capture landfill gas, but a significant point source of methane emissions in the province.

Biosolids drying using heat from cogeneration engines at wastewater treatment plants:

In the next 15 years, biosolids production in Metro Vancouver is anticipated to increase substantially due to the planned upgrade of two primary treatment plants to secondary treatment. Metro Vancouver is undertaking a feasibility study to explore the opportunity to use excess heat from new cogeneration engines at the Annacis Island WWTP to dry biosolids. The dried biosolids would be available for use as a fuel for local industries such as cement manufacturing plants, or for use as a fertilizer. This will provide a new market for Metro Vancouver's biosolids, diversifying and strengthening the Biosolids Program, and potentially displacing industrial carbon emissions from fossil fuel use.

#### *Performance Measures & Results*

- Total tonnes of biosolids beneficially used (1990 to 2015): 1,267,000 bulk tonnes
- Percent of biosolids beneficially used vs. total volume produced (2011 to 2015): 97%
- Tonnes of carbon sequestered in the soil via land application of Class A and/or Class B biosolids (1990 to 2015) (Based on the Biosolids Emissions Assessment Model (BEAM); 2009): At least 95,000 tonnes CO<sub>2</sub>e (using conservative value of 0.25 tonne CO<sub>2</sub>/dry tonne biosolids)
- Tonnes of carbon emissions avoided as a result of the use of biosolids to displace the use of synthetic fertilizers (Nitrogen and Phosphorous production) (1990 to 2015) (Based on the Biosolids Emissions Assessment Model (BEAM); 2009): 72,000 tonnes CO<sub>2</sub>e

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits

- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Metro Vancouver used social marketing approaches to reduce wipes in the sewer system through a 2015 pilot project that has now be turned into a regional campaign. The “Adult Toilet Training” campaign engaged the public by using humour and unconventional tactics, like a roving pink port-a-potty with wipes messaging. Metro Vancouver also measured the number of wipes entering the system in the pilot project area, to test if our approaches were actually reducing the flushing of wipes.

Metro Vancouver produced a series of innovative whiteboard videos on wastewater topics to help residents understand the wider system and specific issues. The videos have helped to explain wipes and grease issues, and how the region’s liquid waste system works. The videos are very accessible and have been used by other organizations as part of their education programs.

### Performance Measures & Results

Your Performance Measure(s)	Your Results (quantitative or qualitative)
<p>The Lions Gate Secondary Wastewater Treatment Plant (LGSWWTP) Project began the community engagement process at the onset of the project in 2012. Community engagement was a process of discovering community values, of eliciting concerns from the interests represented, and balancing competing or divergent views. Local and community interests are integrated into the design of the plant.</p> <p>There have been 16 public and local community meetings, workshops and open houses as well as nine Public Advisory Committee meetings and workshops</p>	<p>Community engagement resulted in the LGSWWTP providing public spaces for community partnership, mutual interests, education opportunities and public engagement, including:</p> <ul style="list-style-type: none"> <li>• 300 m<sup>2</sup> (3,229 ft<sup>2</sup>) of indoor public spaces available for exhibition, education programs, outreach, and public meetings;</li> <li>• 3,500 m<sup>2</sup> (37,674 ft<sup>2</sup>) of outdoor space including an outdoor plaza with landscaping and water features available for public art, use as a gathering area, and education programs; and,</li> <li>• 1,600 m<sup>2</sup> (17,222 ft<sup>2</sup>) of rooftop available as a viewing platform.</li> <li>• After 16 months of engagement with the Public Advisory Committee, it provided recommendations to Metro Vancouver to address the community concerns of the new treatment plant and overall support for the project.</li> </ul>
<p>Different methodologies for processes were tested via Triple Bottom Line Analysis (now used extensively throughout organization). i.e:</p> <ul style="list-style-type: none"> <li>• Outranking methods</li> <li>• Multi-Objective decision analysis (MODA)</li> </ul>	<ul style="list-style-type: none"> <li>• Results meet Metro Vancouver goals and objectives</li> <li>• Stakeholder support</li> </ul>
<p>Metro Vancouver uses Twitter and other social media to connect with many of its target audiences, including residents, businesses, and member municipalities, as well as organizations from around the world. On Twitter we answer questions and get the word out about events, initiatives and public information. Twitter allows us to strengthen Metro Vancouver’s positive reputation locally and abroad as a leader in sustainability, utility services and governance.</p>	<ul style="list-style-type: none"> <li>• <b>Followers:</b> 26,562 as of June 6, 2016</li> <li>• <b>Retweet Rate:</b> ~60% of our tweets are retweeted at least once</li> <li>• <b>Like Rate:</b> ~40% of our tweets are “liked” at least once</li> <li>• <b>Follow rate:</b> Average 11 new followers per day over past year</li> </ul>

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

On July 11 2014, Metro Vancouver Board endorsed the Corporate Energy Management Policy of the organization in identifying and implementing opportunities to improve energy performance at Metro Vancouver, developing accurate and systemic energy use and greenhouse gas emissions tracking systems, as well as policy evaluation, analysis and development.

Metro Vancouver Climate Action Committee is the standing committee of the Metro Vancouver Board that provides advice and recommendations on policies, bylaws, plans, programs, budgets and issues related to the Air Quality & Climate Change service, and the Environmental Planning function within Regional Planning.

Policies are carried out via the Energy Management System, which closely follows the ISO 50001:2011 – Energy Management System, and which is executed by the Energy Management System Task Force and Working Groups.

The Energy Management System Task Force is made up of several full-time staff to develop procedures for evaluating, on a triple bottom line basis: energy performance improvement projects, greenhouse gas emissions reduction projects, and opportunity projects for transitioning to renewable sources of energy throughout Metro Vancouver.

### *Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Energy programs and initiatives that have resulted in monetary savings.	<ul style="list-style-type: none"> <li>The removal of BC Hydro export restriction and implementing an increased co-gen operation strategy has led to an energy consumption savings of CAD \$254,975/year (USD \$198,850/year).</li> <li>VFD pump upgrade at the Iona Wastewater Treatment Plant has resulted in an energy consumption savings of CAD \$50,995/year (USD \$39,770/year).</li> </ul>
Feasibility studies and successful business cases on the best method/s of energy reduction, greenhouse gas (GHG) emissions, and monetary savings within Metro Vancouver and its members.	<ul style="list-style-type: none"> <li>Feasibility study to compare energy efficiency of a vertical turbine pump station design (similar to the existing Trickleing Filter Pump Station) to a dry-well design. BC Hydro-funded study (USD \$26,750 incentive supplied) showed that the dry well design possessed lower maintenance costs and greater seismic reliability.</li> <li>Energy audits of all Metro Vancouver wastewater treatment plants and pump stations have been performed. These audits support ongoing improvements and help to identify and prioritize additional opportunities for advancement.</li> <li>Iona Island Wastewater Treatment Plant Pre-Aeration Blower Upgrade: in 2013 an Aeration Study identified that significant energy savings could be realized by replacing existing multi-stage centrifugal pre-aeration blowers with turbo blowers. Savings of 250,000 kWh /yr per blower (currently ongoing).</li> </ul>
Research activities and support.	<ul style="list-style-type: none"> <li>Research into high efficiency aeration technologies (ongoing) to reduce costs associated with aerating solid contact tanks at Metro Vancouver wastewater treatment plants.</li> <li>Meter testing is ongoing in order to continuously evaluate pump efficiencies and to identify energy savings opportunities.</li> </ul>
Funds provided by Metro Vancouver for direct support of priority energy improvements and initiatives.	<ul style="list-style-type: none"> <li>Substantial funds were provided solely for achieving and managing energy efficiency strategies through the organization. Funds support analyses, research and monitoring for areas of increased energy efficiencies, and total budget is CAD \$1,004,143 (USD \$786,690.07).</li> </ul>
Participation in voluntary energy efficiency programs.	<ul style="list-style-type: none"> <li>Corporate Policy "Design and Construction of Green Buildings" (2012) requires LEED (Leadership in Energy and Environmental Design) certification for all new Metro Vancouver construction larger than 500 m<sup>2</sup>.</li> <li>Metro Vancouver's <del>Annacis</del> Research Centre has achieved LEED Platinum certification – the highest designation within the LEED program.</li> <li>The Lions Gate Secondary Wastewater Treatment Plant will achieve "Superior" designation (following upgrade) for Envision credit CR1.1: Reduce Greenhouse Gas Emissions.</li> <li>Metro Vancouver became a Canadian Power Smart Partner in 2002, and Power Smart Partners are eligible for BC Hydro Design Assistance Program funding to identify energy saving opportunities.</li> </ul>
Reductions in energy needs and reduced reliance on external energy vendors.	<ul style="list-style-type: none"> <li>The removal of BC Hydro export restriction and implementing an increased co-gen operation strategy has led to an energy savings of 3,500,000 kWh/year.</li> <li><del>Annacis</del> Island Wastewater Treatment Plant Aeration Building Upgrade: savings of 12,500 kWh /year (CAD \$1,400/year or USD \$1,097 /year) for lighting upgrade in aeration building.</li> <li>Iona Island Wastewater Treatment Plant Facility Upgrade: savings of 53,600 kWh /year (CAD \$5,200/year or USD \$4,070/year) for lighting upgrade</li> </ul>

	<p>throughout the treatment plant. British Columbia (BC) Hydro incentive funding (CAD \$15,800/year or USD \$12,380/year) was provided in collaboration.</p> <ul style="list-style-type: none"> <li>• VFD pump upgrade at the Iona Wastewater Treatment Plant has resulted in an energy savings of 700,000 kWh/year.</li> </ul>
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## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Annacis Island Wastewater Treatment Plant Co-Generation System Upgrade: replace existing four, 804 kW co-gen engines with four, 1.9 MW co-gen engines to improve biogas utilization. Estimated increase in electricity generation of 20,000 MWh/year. To be completed in 2018.

Iona Island Wastewater Treatment Plant Flared Biogas Utilization: use of all biogas for co-generation applications. Estimated savings of 3,166,000 kWh/year (CAD \$380,000/year). Completed in 2016.

Lulu Island Wastewater Treatment Plant Flared Biogas Utilization:

Installation of infrastructure to purify and sell biogas to local natural gas supplier under established contract. Estimated savings of 9,700,000 kWh/year (CAD \$625,000/year). To be completed in 2018.

Gilbert Trunk Sewage Heat Recovery: construction of a diversion chamber and associated infrastructure to divert sewage from new Gilbert Trunk Sewer near Richmond Olympic Oval for the purposes of heat extraction. Estimated savings of 35,000,000 kWh/year in collaboration with the City of Richmond. To be completed in 2024.

Lions Gate Secondary Wastewater Treatment Plant Effluent Heat Recovery: Developed business case for recovering heat from effluent at new facility, to be sold to local district energy system. This upgrade allows for 20% less energy consumption, and an 80% reduction in CO2 emissions /year as compared to similar wastewater treatment plants in Canada (based on benchmarking data from the National Water and Wastewater Benchmarking Institute). Estimated savings of 40,100,000 kWh/year once completed in 2040.

Metro Vancouver has committed CAD \$4 million in funding to establish the first North American Thermal Hydrolysis Processing pilot unit at the Annacis Island Wastewater Treatment Plant, which will be used to convert wastewater sludge into mostly biocrude, some biogas and CO2, with practically zero solids output. The biocrude can be upgraded to higher-value transportation fuels such as biodiesel or biojet fuel.

Performance Measures & Results

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Generated and utilized energy	Current co-generation facilities at the Iona Island and Annacis Island Wastewater Treatment Plants provide energy for electricity and heat, and generated a total 39,092,898 kWh in 2015 alone.
Usable Heat Generation	<ul style="list-style-type: none"> <li>• Of Metro Vancouver’s wastewater treatment plants, three utilize heat captured from power generation equipment.</li> <li>• Metro Vancouver is working to enable municipalities to use energy from sewers to heat nearby buildings.</li> </ul>
Green House Gas (GHG) Reductions	<ul style="list-style-type: none"> <li>• Metro Vancouver’s Corporate Climate Action Plan proposed establishing an internal price for GHG emissions within the corporate decision making process, at a level which would encourage lower GHG emitting projects. Setting an internal price on carbon is a practical means of ensuring that greenhouse gas emissions are considered in all business decisions, especially those that involve energy.</li> <li>• The removal of BC Hydro export restriction at Iona Island Wastewater Treatment Plant and implementation of new co-gen operation strategy has led to a saving of 87.5 tonnes of CO<sub>2</sub>e/year.</li> <li>• Premium efficiency motors upgrade for Pre-Aeration blowers at the Iona Wastewater Treatment Plant has resulted in a savings of 2.4 tonnes of CO<sub>2</sub> eq/year.</li> <li>• By connecting shop heaters to DDC, Metro Vancouver’s Lake City Operations Centre was able to reduce its GHG emissions by 36.0 tonnes of CO<sub>2</sub> eq/year.</li> </ul>



## ***Metropolitan Water Reclamation District of Greater Chicago IL***



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### **Metropolitan Water Reclamation District of Greater Chicago IL**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**



<b>Utility Description</b> (combine all plants if a multi-site system)		
Type: Regional System		
Service Area (square miles): 883.4	Average annual daily flow (MGD): 1,300	
Population Served: 5.25 Million		
<b>Location</b>		
Street Address: 100 East Erie Street		
City: Chicago	State: Illinois	Zip Code: 60611
<b>Contact Information</b>		
Name: Allison Fore	Phone: 312-751-6626	Email: ForeA@mwrdd.org

**NARRATIVE:** Since inception, the Metropolitan Water Reclamation District of Greater Chicago (“MWRD”) has been improving the environment and protecting public health, but the way it views its work has evolved over 127 years. Sewage is no longer a waste product, but instead a collection of resources to be recovered and reused; similarly, it has become proactive instead of reactive, and works in partnership with its neighbors. It was with this paradigm shift that the MWRD adopted a culture of excellence, collaboration, and innovation, which is enabling plans that are bold yet wholly achievable.

The MWRD launched its second strategic plan with the vision of “Recovering Resources, Transforming Water.” Foundational to transformations is the quality of excellence. Proactive decisions by leadership point out a straight path to maintaining financial sustainability: the 2016 bond refunding will provide savings in excess of \$120 million, and insurance coverage will protect \$10.5 billion of assets and claims. Employees also are committed to exceeding expectations as individuals and as an organization, so despite the MWRD consistently being recognized as one of the best – serving the community at half the cost of other wastewater agencies in the region – its employees still seek additional excellence by meeting and even exceeding training requirements.

For employee excellence, collaboration by the MWRD is a critical success factor. The MWRD works with employees to participate in leadership development, and each department engages in succession planning and cross-training to ensure knowledge continuity and perpetual excellence. Employees are also empowered to provide process improvement recommendations and take ownership of various plans and projects.

Outside the MWRD, collaboration brings environmental, societal, and economic benefits. The MWRD works with Councils of Governments and 21 local and national organizations to improve water and nutrient management, enhance public space, improve waterways access, and enhance habitats. The MWRD also helped launch “Current,” a partnership of public and private leaders, to leverage the strength of the region’s water industry to drive research and generate economic impact through systems advancements, innovative technology, and industry investment and employment.

A tangible result of these partnerships are green playgrounds from the “Space to Grow” program. With other Chicago organizations, expanses of asphalt in low-income schools are transformed with landscaping that absorbs rainwater, helping to address neighborhood flooding issues, providing an opportunity for the neighborhood to grow and reconnect with nature, and supporting student health and physical activity. The MWRD aims to transform 34 schoolyards by 2019.

The MWRD engages residents directly through tours, open houses, and social media to educate and help its audience understand their role in protecting the environment. As a result, residents have deployed

56,000 rain barrels and planted 7,000 trees supplied by the MWRD in the last year to help prevent flooding, reduce water usage, and improve air and water quality. They have also submitted nearly 500 pounds of medications during Drug Takeback Days to reduce harmful contaminants in the water, and a permanent program for collection has now been implemented. Broadening its audience, the MWRD has even traveled to and received visits from Australia, China, Denmark, India, Israel, Nigeria, and other countries to share expertise on wastewater treatment.

Additional education exists in developing a potential workforce. College internships encourage wastewater treatment careers and provide jobs to the community, and vendor outreach fairs introduce local minority-owned, women-owned, and small businesses to opportunities for growth.

With excellence and collaboration, innovation is naturally interwoven throughout. The strategic plan lists innovation as a value, and non-traditional techniques have been developed to achieve resource recovery goals, making it the official vehicle for innovation. Biosolids was an obvious choice to reimagine as a resource, so the MWRD partnered with others to successfully amend legislation to qualify exceptional quality biosolids as a sustainable fertilizer for public use. In the next year, 10,000 tons of safe, beneficial, and renewable composted biosolids will be produced, with incorporation into 72 community gardens and other landscaping. The MWRD leads the industry in biosolids for beneficial reuse.

With the goal of energy neutrality by 2023, development of two major technologies will ultimately reduce needs, costs, and greenhouse gases. The first reduces energy consumption in nitrogen removal through the use of beneficial bacteria to convert ammonia into nitrogen. This deammonification process, called ANITA Mox, could reduce energy usage by 120 million kWh annually – enough energy for 4,500 homes. The second leading-edge development is a membrane-aerated biofilm reactor technology called ZeeLung, which could expand existing aeration tank capacity without adding infrastructure, accomplishing nitrification in a smaller tank volume. This technology has the potential to reduce annual energy consumption for aeration at the O'Brien WRP by 30%, or 11 million kWh.

While technology progresses, energy conservation has begun in more immediate ways. Energy audit recommendations of equipment replacements and installations are being implemented, with a projected savings of \$800,000 annually. The MWRD also participates in a voluntary energy curtailment program to reduce loads during peak demand periods, resulting in \$1.9 million in curtailment rebate revenue in 2016.

Energy generation, meanwhile, does not falter. The MWRD plans to increase biogas production using outside liquid organic wastes, which can then be processed for sale as biomethane – an alternative to gasoline – producing revenues and reducing greenhouse gases. Approximately 900 mmBTU can be produced daily, translating into \$6 million in total annual revenues. Other forms of generated energy include hydroelectricity from an elevation drop at the Lockport Powerhouse, producing 40 million kWh per year; 2,040 therms of solar energy generated annually, providing for hot water needs at the Egan WRP; and thermal energy capture, dubbed “sewerthermal,” using plant water as a heat source/sink, reducing electricity usage at the Kirie WRP administration building by 50%.

In addition to being harnessed, water is also reused directly. Every day, 15.1 million gallons are reused in pipeline flushing, blower motor cooling, post-centrifuge centrate flushing, and tank cleaning. To further reduce usage, the MWRD is pursuing reuse applications for the high quality water its plants produce.

Working with large industrial users in the Calumet and Stickney corridors to find reuse opportunities, this would provide cost savings to the industrial users and increase fresh water availability for communities.

Applying recovery to nutrients, Ostara's Pearl nutrient recovery technology was implemented in 2016 to reduce nutrient effluent to the Mississippi River Basin and reduce its hypoxia impact in the Gulf of Mexico. This is the world's largest nutrient recovery facility, and 10,000 tons are expected to be produced annually. The MWRD is also researching the sustainability of growing algae in a "vertical revolving" fashion; this would reduce the footprint to grow an equivalent algae biomass in a surface pond and simplify the harvesting process. The algae could remove at least 50% of phosphorus from wastewater and can be commoditized for production of bioplastics, biochemicals, biofuels, or aquaculture feed.

Further afield, the MWRD seeks solutions on a watershed basis by implementing a holistic program to address water issues. The Tunnel and Reservoir Plan cost-effectively responded to water quality standards with four tunnel systems totaling 109.4 miles in the 375 square mile combined sewer area. Most recently, the Thornton Composite Reservoir came online, providing flood relief for 556,000 people and 182,000 structures in 14 communities throughout the south side of the MWRD community, and improving water quality in the Calumet Rivers and Calumet-Sag Channel.

The second prong of this program is collaboration with stakeholders. The MWRD worked with county governments to develop plans for the six major watersheds, each listing areas of concern, potential capital improvement projects, and an implementation plan. The MWRD also spearheaded a workgroup to research creation of an "Environmental Utility," a state-wide entity to target the most cost-effective and high-impact watershed projects.

MWRD policies promoting green infrastructure (GI) also call for collaboration. The Watershed Management Ordinance requires developments in suburban Cook County to implement GI to capture stormwater runoff on-site. Concurrently, the MWRD's Comprehensive Land Use Policy requires new governmental tenants to install GI, while a rent credit encourages new commercial tenants to do so also.

Fundamental to the watershed is water quality. Sidestream Elevated Pool Aeration stations pump up to 1.3 billion gallons of water daily to add 25 tons of oxygen into the Chicago Area Waterway System. Ambient water quality monitoring is conducted at 28 locations; samples are analyzed regularly for over 30 constituents and organic priority pollutants. An indicator of this water quality is the number of fish species present – the MWRD currently counts 58.

Although the MWRD tries its best to provide flood solutions, sometimes prevention is just not possible; in those cases, the MWRD and local jurisdictions identify residential structures subject to flooding, purchase the property, clear the structure, and maintain the land as open space in perpetuity. To date 18 structures have become open parkland, and 184 more are planned for conversion.

With a focus on excellence, collaboration, and innovation, the MWRD marches on in protecting the environment, improving its communities, and maximizing every tax dollar. Through the lofty goals of its leaders, the creative ideas of its staff, and the cooperation of its partners, the MWRD is transforming the concept of water management from waste to opportunity.

**ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed
  - Drives an awareness and commitment to workplace safety
  - Maintenance of Financial Sustainability

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Level of integration of the Strategic Plan in daily work	Full Integration: <ul style="list-style-type: none"> <li>• Each department implements initiatives each year to attain internal goals to Add Value, achieve Excellence, Develop Employees, and leverage Technology; initiatives in Resource Recovery and Leading Partnerships address external</li> </ul>

	<p>community needs. These initiatives are published in each year's Budget, and results are reported in the following year.</p> <ul style="list-style-type: none"> <li>• Executive Director's Town Hall Meetings, bi-monthly employee newsletters, and new employee orientations directly connect the Strategic Plan to all work at the District.</li> <li>• Development of metrics to measure success of the Strategic Plan for reporting to the public and continuous improvement.</li> </ul>
Percentage of employees meeting/exceeding the mandatory 24 hours of development per year	100% meeting/83% exceeding
Availability of leadership development opportunities	<p>Development program that includes:</p> <ul style="list-style-type: none"> <li>• Individual executive coaching assessments, with post-assessment providing insight into innate capabilities and suggestions for additional development opportunities.</li> <li>• Partnership with local Civic Leadership Academy to enroll District staff in training to become leaders.</li> </ul>
Extent of Succession Planning Implementation	Three Deputy/Assistant positions were added in anticipation of retirements at the Executive level, allowing incumbents to receive mentoring and coaching to facilitate transition into full executive level roles. This approach is also being introduced at lower levels in the organization for critical positions.
Number of innovative initiatives developed/implemented	<ul style="list-style-type: none"> <li>• 2 Completed: Thornton Reservoir, two disinfection facilities.</li> <li>• 3 Executed: World's largest Phosphorous Recovery facility will be operational in 2016 at our Stickney Water Reclamation Plant; "food to energy" initiative to double gas production at the Calumet Water Reclamation Plant; plan to be energy-neutral by 2023.</li> </ul>
Opportunities for employees to solve inefficiencies and decrease expenses	<ul style="list-style-type: none"> <li>• In-house trades staff has taken direct responsibility for ongoing maintenance and repairs of District equipment, reducing the need for consultants.</li> <li>• All employees are invited to identify bottle-necks in procedures and suggest solutions.</li> </ul>
Number of Safety trainings/reduction in claims and costs	<ul style="list-style-type: none"> <li>• &gt;1,200 OSHA-focused training sessions in 2015.</li> <li>• 37% reduction in lost time claims and 44% reduction in Workers' Compensation claims costs since 2013.</li> </ul>
Financial Health	<ul style="list-style-type: none"> <li>• Strong General Fund balance: 85% of expenditures in 2015</li> <li>• 13% increase to Reserve Balance in 2015 (from \$113 million to \$128 million)</li> <li>• AA+/ Stable (Standard and Poor's) and AAA/Stable (Fitch) credit ratings</li> <li>• Four awards for financial reporting excellence from the Government Finance Officers Association</li> </ul>
Extent of Financial Sustainability Plan Implementation	<ul style="list-style-type: none"> <li>• Savings in excess of \$120 million of future debt service achieved through the 2016 bond refunding</li> <li>• \$10.3 billion insurance coverage for assets and claims</li> <li>• Continued Pension funding at maximum levels; 100% funding expected by 2050</li> <li>• Second year of advance Funding of the Retiree Health Care Trust to allow 100% funding by 2026</li> <li>• Third year of Long-term Capital Planning utilized to balance and prioritize regulatory, strategic business, and community expectations with long-term financial projections through 2022</li> </ul>

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Collaboration in legislative action to recognize EQ biosolids as a resource and not a waste.

### *Performance Measures & Results*

- % of biosolids beneficially used vs. total volume produced- 82% in 2015
- % of public distribution vs. total utilization: 27% in 2015
- 10,000 tons of EQ composted biosolids in 2016 with annual increase up to 100,000 tons by 2018: Projected to meet or exceed 10,000 tons of EQ composted biosolids in 2016
- Increase the local use of biosolids up to 100% by 2018: 23% in 2015

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement
  - Actively promotes community awareness of the value of water and wastewater and stormwater collection and treatment's role in the social, economic, public, and environmental health of the community
  - Involves stakeholders in the decisions that will affect them, understands what it takes to operate as a "good neighbor," and positions the utility as a critical asset to the community
  - Outreach to partnering organizations and neighbors
  - Community workforce development and education programs in place
  - Administers a rain barrel program and oak tree sapling program

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Number of Outreach Events/Participants to educate on the mission of the District and to invite collaboration	<ul style="list-style-type: none"> <li>• Hosted nearly 200 tours/open houses with over 8,000 visitors</li> <li>• Attended over 160 outreach events, meetings, and speaking engagements, impacting more than 50,000 people</li> <li>• Visited over 90 schools and other organizations and institutions to educate more than 6,000 people</li> </ul>

Activity Level of Communication with the Public regarding resource recovery, water quality improvements, and stormwater management	<ul style="list-style-type: none"> <li>• Accommodated hundreds of media requests for media reports covering MWRD programs and ongoing projects</li> <li>• Over 453,000 people reached by nearly 600 posts on Facebook</li> <li>• Over 1 million impressions through over 478 tweets on Twitter</li> <li>• Published and distributed more than 100 press releases and more than two dozen brochures, handouts, and videos promoting District work, goals, and mission</li> </ul>
Involvement Levels in the Stormwater Management Master Plan Pilot Studies to address flooding challenges	<ul style="list-style-type: none"> <li>• 5 locations across the county</li> <li>• Hosted several meetings/expos</li> <li>• Collaborating with 4 types of stakeholders: elected officials, public works managers, homeowners and businesses</li> </ul>
Level of Leadership/Participation by Employees in Community Organizations to improve wastewater/stormwater/nutrient management, enhance public space, improve access to waterways, and enhance the local habitat	<ul style="list-style-type: none"> <li>• 15 local organizations: Millennium Reserve, Cook County Planning Advisory Board, CMAP Wastewater Planning Group, Illinois Nutrient Plan, Chi-Cal Rivers Fund, Chicago Wilderness, Cal-Sag Channel Watershed Planning Council, Little Calumet River Watershed Planning Council, Lower Des Plaines River Watershed Planning Council, North Branch of the Chicago River Watershed Planning Council, Poplar Creek Watershed Planning Council and Upper Salt Creek Watershed Planning Council, Illinois Water Environment Association, American Public Works Association Chicago Metro Chapter.</li> <li>• 6 National organizations: Water Environment Federation, National Association of Clean Water Agencies, Value of Water Coalition, American Public Works Association, Water Environment Research Foundation, American Society of Civil Engineers.</li> </ul>
Number of Partner Organizations/Number of rain barrels and saplings distributed	<ul style="list-style-type: none"> <li>• 80 organizations (65 municipalities, 15 non-governmental organizations)</li> <li>• 56,000 rain barrels/7,000 saplings</li> </ul>
Implementation progress of the Space to Grow program	<ul style="list-style-type: none"> <li>• Partnered on 2 school yard transformations in 2015 and plan for 4 more in 2016</li> <li>• Hosting year-round green infrastructure educational activities</li> <li>• Received numerous awards, including the 2016 Best of Green School Award for Collaboration by the Center for Green Schools at the U.S. Green Building Council in collaboration with the Green Schools National Network</li> </ul>
Number of Initiatives to promote workforce development and education	<p>4 Initiatives:</p> <ul style="list-style-type: none"> <li>• Internship Program to attract new graduates to wastewater/stormwater treatment careers and provide jobs to the community</li> <li>• Vendor Outreach Fairs to promote vendor diversity re: minority- or women-owned or small businesses</li> <li>• Joined “Current,” a public-private initiative to advance the efficiency and resiliency of water systems, develop and deploy innovative water technology solutions to safeguard clean water and improve wastewater treatment, and drive increased investment and employment in the water industry</li> <li>• Participation in local school programs on science, technology, engineering, medicine, and mathematics.</li> </ul>

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)
  - Developing technology to expand aeration tank capacity without increasing aeration
  - Participation in voluntary energy efficiency programs
  - Investigating energy efficient biosolids dewatering processes

### *Performance Measures & Results*

- Progress towards Energy Neutrality by 2023: 27% as of 2016
- Annual electricity use reduction from membrane-aerated biofilm reactor (MABR) technology: 11,000,000 kWh, projected after full-scale application
- Annual revenue from electricity curtailment program: \$1.9 million
- Annual electricity use reduction from improving biosolids dewatering processes (Volute Dewatering Press) Initial testing completed; projected savings: 93% reduction in electricity usage.
- Large-scale testing projected in 2017.
- Status of energy reduction plan: Completed energy audit; recommendations being implemented by energy efficiency team at Calumet WRP: upgrade interior lighting and HVAC controls, install steam blankets, and replace boilers.
- Annual savings from building energy conservation measures: \$800,000 projected
- Annual electricity use reduction from deammonification process: 2,000,000 kWh projected from use of ANITAMox vs. current operation for ammonia treatment at Egan WRP. Process currently being commissioned.

## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Use of supplemental organic wastes to maximize production of biogas

### *Performance Measures & Results*



- Annual biogas utilized: 8,000,000 Therms actual utilized in plant boilers
- Annual hydroelectricity produced: 40,000,000 kWh
- Annual solar thermal heat produced: 2,040 Therms
- Annual additional biogas produced: 800,000 Therms projected with organic feedstock

**NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities

Recovery of phosphorus and nitrogen for reduced nutrient effluent load and reuse of nutrients as agricultural fertilizer

*Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Progress on Strategic Plan Goal: Resource Recovery	<ul style="list-style-type: none"> <li>• Goal published in Budget Book 2016</li> <li>• Implementation of plan and contract with Ostara in 2016 to collect phosphorus and nitrogen at the Stickney WRP and sell as a fertilizer; 10,000 tons expected to be produced annually.</li> </ul>
Annual phosphorus recovered from struvite harvesting process	1,200 tons projected
Annual nitrogen recovered from struvite harvesting process	570 tons projected
Status of research on alternative phosphorus removal technology	<ul style="list-style-type: none"> <li>• Proprietary revolving algae biofilm reactor pilot unit in place to evaluate potential for phosphorus recovery.</li> <li>• Harvested algae biomass being evaluated for potential sale as commodity product for bioplastics, biochemicals, biofuels, or aquaculture feed.</li> </ul>

**WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

Use of plant effluent within Water Reclamation Plants Investigating how to supply plant effluent to industrial users

*Performance Measures & Results*

- Plant effluent reuse within WRPs (MGD): 15 MGD
- Status of water reuse for off-site industry
  - o Currently pursuing reuse applications for the high quality water produced at WRPs
  - o Partnered with the Illinois American Water Company and other large industrial users to explore options for the reuse of treated water within the industrial community in the Calumet and Stickney corridors

**WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
  - Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
  - Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
  - Ecosystem enhancements for improved hydraulics or water quality, including:
    - o Riparian reforestation to enhance pollution mitigation functions
    - o Stream channel restoration for increased hydrologic stability
    - o Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
  - Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.
- Holistic, integrated program to address water quality and wet weather issues
  - Collaboration with stakeholders to address water quality and wet weather issues
  - Evaluation of water quality
  - Reduction of contaminants in the water system
  - Promotion and enablement of green infrastructure

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Implementation of the Tunnel and Reservoir Plan	Coverage of 375 square miles combined sewer area consisting of Chicago and 51 suburbs, or 109.4 miles of tunnels, 8 to 33 feet in diameter and 150 to 300 feet underground

Development of Watershed Plans for Cook County	6 Plans developed, modeling the waterways, identifying and evaluating alternative solutions to stormwater related issues, and quantifying the benefits and costs of these solutions in order to help prioritize their implementation.
Oxygen levels in waterways	<ul style="list-style-type: none"> <li>• DO increase of up to 25 tons daily through use of Sidestream Elevated Pool Aeration stations</li> <li>• Monitoring of DO levels found hourly DO concentrations were greater than the applicable standard &gt;90% of the time at 14 continuous monitoring stations on an annual basis</li> </ul>
Gallons of Stormwater retention installed with partnerships using Green Infrastructure (GI) techniques	>1.48 million gallons of Stormwater retention capacity created
Linear feet of stream restoration for channel stability, hydraulic capacity	5,181 linear feet of stream channel from 4 completed projects
Number of ambient water stations assessed	<ul style="list-style-type: none"> <li>• 26, finding &gt;90% of constituents compliant with water quality standards</li> <li>• 27, finding 99.8% of analyses of organic priority pollutants below the reporting limit</li> </ul>
Partnerships with area organizations to protect the waterways	<ul style="list-style-type: none"> <li>• 3 key partnerships: Council of Governments, Chicago Area Waterways Chloride Reduction Initiative Work Group, DuPage River Salt Workgroup</li> <li>• 36 out of 45 surveys completed by stakeholder organizations for Chloride Reduction initiative Work Group</li> </ul>
Activities to evaluate water quality	Non-mandatory water sampling and fish surveys
Medications collected and diverted from waterways	<ul style="list-style-type: none"> <li>• Approximately pounds collected in past nine months through Drug Take Back Days</li> <li>• Permanent 24-hour a day collection program implemented</li> </ul>
Implementation of policies that promote green infrastructure	<ul style="list-style-type: none"> <li>• The MWRD's Watershed Management Ordinance requires GI and run-off control, and provides a manual to assist facilities to meet the volume requirement.</li> <li>• The Comprehensive Land Use Policy requires government-leased land to implement GI, and provides a rent-reduction incentive to commercially leased land. The Policy applies to around 20,000 acres of District-owned land.</li> </ul>

## Miami Dade Water & Sewer Department FL



### Miami Dade Water & Sewer Department FL

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): <i>Multiple Plants (3 large and 5 Small WTP's plus 3 large WWTP's); a large Water Distribution System (8,206 mi of water mains) and a large wastewater collection system (1,047 PS's plus 6,309 miles of pipelines).</i>		
Service Area (square miles): <i>400 square miles</i>	Average annual daily flow (MGD): <i>290MGD</i>	
Population Served: <i>2.3 Million people</i>		
Location		
Street Address: <i>3071 SW 38th Avenue</i>		
City: <i>Miami</i>	State: <i>FL</i>	Zip Code: <i>33146</i>
Contact Information		
Name: <i>Hardeep Anand, P.E.</i>	Phone: <i>(786) 552-8571</i>	Email: <i>hardeep.anand@miamidade.gov</i>

**NARRATIVE:** Miami Dade is the consolidated service provider of one of the fastest growing urban centers of the world. For decades its primary focus has been providing safe, reliable and available resources at the turn of a tap; however, to keep up with population and business growth, increasing number of environmental, economic and social components, as well as the need to quickly and effectively respond to chronic challenges, peak demand, aging infrastructure, disasters and other global trends, the leadership team of Miami-Dade Water and Sewer Department (WASD) has intentionally moved to actions to become a Utility of the Future Today. This endeavor is being implemented with a conscious change in organizational culture to providing services and delivering much needed new infrastructure to meet not only today's demands but to ensure that we provide adequate capacities for the future, while addressing the resiliency needs of the region.

WASD has embarked on a reorganization that encourages a culture of excellence, embraces positive change and empowers its workforce. The new culture promotes leadership and constant improvement; it also focuses on a proactive approach instead of a reactive mentality; fostering a spirit of innovation and latest technology to streamline processes and effectively update procedures for efficiency and optimization.

### **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

#### Restructuring of the organization

- WASD has implemented a restructuring of their organization to allow for a comprehensive approach on planning, operations and maintenance. The new structure is asset driven as opposed to project driven. This results on standardizing and streamlining of procedures, designs, and procurement, creating efficiency and elimination of silos and enhancing greater collaboration and communication between engineering, planning & operations teams.
- The local community considers climate change and sea level rise as a priority issue that needs immediate attention. As a result, WASD has implemented a Resiliency Program that will account for ways to address sea level rise, climate change, and energy optimization among other related initiatives.
- WASD is reviewing its design standards while also adopting national design rating systems, which incorporate holistic sustainable concepts in the infrastructure being built. This is being

further reinforced internally through a train-the-trainer concept so that the intent of building sustainable and resilient infrastructure is consciously adopted throughout the workforce.

#### Employee Development and Training Programs

- WASD has a mentoring program, in which experienced staff in leadership and management roles is paired with staff who desires to grow within the ranks of the organization. This serves as an on the job leadership development and assures competency of the upcoming staff.
- WASD's new organizational structure establishes a Program Management Office that institutes project controls, identifies and implements training opportunities to incrementally professionalize staff, develop knowledge management and plans for succession, serve as the bridge between planning-capital-operation teams, and engage teams in a continuous improvement mode across the organization.
- WASD leadership commenced efforts to strategically identify and encourage the participation of key staff to attend local, national and international seminars and conferences so that the utility can passively and incrementally take advantage of upcoming technological advancements in the utility industry while establishing professional networks to continuously engage. This is being further enhanced by encouraging the submittal of professional presentations and papers in journals and industry events around the nation.

#### Innovation

- WASD's culture of innovative enterprises includes ongoing work of the Geographical Information Systems (GIS) group to develop tools that collaborates with other agencies. The iWASD tool allows for a platform to share information and to collaborate among utilities but most importantly to coordinate project schedules and scopes. This initiative is supported by WASD senior leadership, providing the necessary funds and staff to continue on and possibly expand.
- WASD's leadership encourages innovation through the procurement of its large-scale capital improvement projects. As part of the implementation of the \$13.5B capital program over the next 15 years, WASD leadership is committed to ensuring that our infrastructure designs and procurement efforts fosters and promotes innovation in the technical proposals from the consulting community.

#### *Performance Measures and Results*

The new structure provides a clear definition of what constitute capital projects vs renewal and replacement efforts; encouraging and providing a framework for collaboration between the Capital Improvement, planning and operation teams. There is a set approach for vetting of projects; strong communication between planning and operations; and implementation of Capacity Maintenance Operations and Management plans resulting in better accountability and measuring of success. Lastly, it provides for better use of manpower and technical resources.

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
  - Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
  - ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
  - Energy management-related training provided to plant staff
  - Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)
- 
- As part of the County commitment to energy efficiency policies, the County Commissioners passed Sustainability Ordinance 07-65 requiring all new buildings or additions achieve “Silver” or higher LEED designation. WASD also developed its First Sustainability Plan addressing Energy Efficiency 2010 with a set 20% Electric Energy Reduction Goal. It has also established an Energy Performance Contracting Program enabling Departments to hire ESCOs to design and implement energy savings improvements.
  - WASD conducted and implemented EnergyCAP, an energy management system to identify priorities for energy efficiency improvements. It currently measures and analyzes 1070 electric account and prepared Energy Audits at specific large energy use facility.
  - Another integral aspect of the culture for energy efficiency is workshops to technical staff on energy efficiency evaluation, and resolving issues that contribute to excess energy use. There are on-going trainings of technical staff on new and existing systems that improve energy management. Lastly, the POWER Program (Partnership Optimizing MDWASDs Efficiency and Reengineering) is an employee recognitions program for participating in measured efficiency improvements, including energy.
  - WASD implemented operational initiatives to conserve energy. For instance, a Water Efficiency Use Program reducing water consumption by 40MGD from 2006, with associated energy savings on treatment and pumping. It embarked on a Water Leak Detection Program to reduce line breaks by 44% over 6 years and saving energy on lost water. On the wastewater side, the Inflow and Infiltration Program is reducing groundwater infiltration into the sanitary sewer system, thus reducing energy use for pumping and treating excess water.

### *Performance Measures and Results*

Energy Consumption is tracked using EnergyCAP system for over 100 facilities and abnormal usage is analyzed to identify problems and subsequent solutions. Significant energy savings have been obtained since EnergyCAP has been in place. Also, significant reduction of water consumption (40MGD) through a very successful program established by WASD since 2002 has reduced Energy Consumption significantly.

## **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed.
  - WASD entered in an agreement with Solid Waste Department to take the landfill gas produced and combine with digester gas to generate electricity and heat. Electricity to reduce plant purchases of electricity and heat to operate an adsorption chiller to cool ventilation and combustion air. Quantitative goals were developed and shared with stakeholders regarding return on investment to upgrade the 25 year old cogeneration facility. WASD is currently designing anaerobic digester improvements to maximize digester gas production and more fully utilize cogeneration capacity.
  - WASD evaluated both internal energy sources (digester gas) and locally available landfill biogas as a source of renewable energy for fueling new high efficiency internal combustion engines. It also evaluated the use of solar for sludge drying and disposal for use in agriculture by maintaining high sludge quality.
  - The following heat recovery systems have been adopted: heat recovery to operate an adsorption chiller to cool ventilation and combustion air in Cogeneration Facility; heat recovery system used for heating the existing digester clusters; and heat recovery system also to heat biosolids handled by the future Biosolids Processing Facility.

## **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.



- As part of the effort to establish a unified vision that integrates water supply, conservation, recycling, runoff management, wastewater facilities and infrastructure planning, WASD coordinates with other local agencies and regulatory bodies (i.e. RER, SFWMD) for a combined watershed management process. This includes the elimination of ocean outfalls, management and control of saline intrusion and water reuse to name a few.
- WASD draws its drinking water from the Biscayne Aquifer. Due to its porosity and proximity of the water table to the ground, the aquifer is vulnerable to pollution. To protect the aquifer, the County oversees a Wellfield Protection Program, that includes inspection of all 8-inch and larger gravity pipes to reduce the exfiltration and two sets of monitoring wells. The monitors wells focuses on quality in the Biscayne Aquifer and salt-water intrusion. The program also includes provisions to reduce contamination from septic tanks and septic water disposal.
- WASD is updating the existing water re-use feasibility study. This study will also be linked to the requirements of the water use permit to include re-use (i.e. 90 MGD for FPL cooling towers).
- WASD has included sea level rise and climate change in its criteria to size wastewater facilities. This includes the effect of sea level rise on the I/I flows to the system, on total rainfall depth, and for design storm events. In addition, WASD has initiated a series of workshops with local agencies and wastewater industry to discuss inclusion of resiliency principles within their business practices.

## *Milwaukee Metropolitan Sewerage District WI*



### **Milwaukee Metropolitan Sewerage District WI**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Watershed Stewardship**
- ★ **Integrated Growth Planning**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type: Regional utility with 2 reclamation facilities, Jones Island and South Shore; Headquarters and associated labs; 300 mile conveyance system for the Metropolitan Interceptor Sewer; 28.5 miles Inline Storage System (Deep Tunnel); research vessel – R/V Pelagos		
Service Area (square miles): 411 square miles	Average annual daily flow (MGD): 183.9 MGD (2015)	
Population Served: 1.1 million; 28 municipalities		
<b>Location</b>		
Street Address: 260 W. Seeboth St.		
City: Milwaukee	State: Wisconsin	Zip Code: 53204
<b>Contact Information</b>		
Name: Kevin Shafer, Executive Director	Phone: 414-225-2088	Email: kshafer@mmsd.com

**NARRATIVE:** Milwaukee Metropolitan Sewerage District (MMSD) is recognized as one of the premier water reclamation utilities operating in the United States. Jones Island Water Reclamation Facility (JIWRF) became operational in 1926 and piloted the activated sludge treatment process. In 1927, MMSD began production of its bio-solids fertilizer, Milorganite®. Operations expanded in 1968 with the addition of a second facility, South Shore (SS). Completion of the 28.5 mile Inline Storage System in 1994 reduced overflows from 50 – 60 per year to an average of 2.4 per year. Since deep tunnel operation began, MMSD has captured and cleaned an average of 98.3% of stormwater and wastewater entering its system, surpassing WPDES permit requirements.

Building on this foundation of excellence, in late 1990s, MMSD broadened its vision and directed resources to incorporate a comprehensive watershed approach to meet its charge to protect public health and the region’s waterways. With visionary leadership and innovative organizational culture, MMSD integrated watershed-based planning with exemplary operations of facilities and conveyance systems.

In 2002, two major planning efforts began -- MMSD’s 2020 Facilities Plan and Southeastern Wisconsin Regional Planning Commission’s (SEWRPC) Regional Water Quality Management Plan Update (RWQMUPU). MMSD, Wisconsin Department of Natural Resources (WDNR) and SEWRPC formed the Water Quality Initiative (WQI) partnership to integrate these plans using shared data and analysis to assess water quality (WQ).

Extensive public engagement in development of the 2020 Facilities Plan gave stakeholders significant input. The WQI emphasized a watershed approach to reduce nonpoint pollution and identified priorities to advance the region’s WQ.

The 2020 Facilities Plan laid the foundation for bold initiatives -- watershed restoration plans for the Menomonee and Kinnickinnic Rivers (2010); 2035 Vision and Strategic Objectives (December 2010); SeWeR: Sustainable Water Reclamation Plan (February 2012); Regional Green Infrastructure Plan (June 2013); a pilot MS4 watershed-based stormwater permit (2012); 3rd party TMDLs for the Menomonee, Kinnickinnic, and Milwaukee Rivers and Milwaukee River Estuary; and Energy Plan (2015) with the goal to obtain 100% of energy needs through renewable resources.

The 2035 Vision with two key elements – Integrated Watershed Management and Climate Change Mitigation/Adaptation emphasizing Energy Efficiency -- and the commitment to sustainability drive actions detailed in this application.

Key attitudes infuse MMSD’s organizational culture – all staff are instrumental to the mission and fulfillment of the 2035 Vision; successful progress toward its goals is predicated upon productive internal teams and external partnerships; encouragement for out-of-the-pipe thinking that addresses challenges with a “What if?” approach, and “When we work together as a region, we succeed as a region.”

Interdependence is stressed with cross-organizational teams working on core initiatives such as District-wide implementation of green infrastructure (GI), bio-solids promotion and research, and energy efficiency/generation advancements.

Out-of-the-pipe thinking is exemplified by the landfill gas energy project, development of a Regional GI Plan identifying opportunities and establishing priorities; programs focused upstream, outside the service area, to positively impact WQ goals downstream through the Greenseams® and Working Soils® programs; and the goal to capture the equivalent of the first ½ inch of rainfall (740 million gallons) that falls on impervious cover in the planning area.

Initiatives are solution oriented and research-based. MMSD has established relationships with universities and industry partners. The Water Council, the Fund for Lake Michigan, and MMSD formed a partnership to identify research topics, solicit proposals and award grants. MMSD is also a founding member of the NSF-funded Industry/University Collaborative Research Center on Water Technology.

MMSD’s policies and programs reflect its commitment to workforce development and training with spending in this area averaging ½ million dollars annually. The District’s workforce development programs help individuals develop skill sets for work in trades and businesses that interface with MMSD’s mission and help underutilized businesses develop capacity to compete for contracts.

A Talent Development Program preserves institutional knowledge and skills ensuring knowledge transfer prior to employees leaving MMSD. Key components include identification of critical positions, selection of Accelerated Pool Candidates, a knowledge transfer process and the development of career ladders to enhance upward mobility and learning opportunities.

MMSD provides employees opportunities to learn about new initiatives and policies and discuss concerns through open, informal gatherings including Lunch in the Lab, Coffee with Kevin, and Brown Bag Lunches. MMSD fosters a strong, supportive community among its employees through its Employee Connection Program, Wellness Program, special events and opportunities for community service.

MMSD, a national leader in the area of biosolids reuse, operates one of the nation’s oldest and largest recycling efforts. The manufacturing of its class A-biosolids fertilizer, Milorganite®, began in 1926. In 2015, close to 44,000 tons of Milorganite® were manufactured and distributed. The iconic brand is known world-wide and was the model when EPA created its “Exceptional Quality Standards.”

Milorganite® is sold in over 12,000 retail and professional distribution outlets. MMSD relies on a host of partnerships to effectively execute production, inventory control, packaging, shipping, regulatory compliance, marketing and sales. Since its inception well over 9 billion pounds of the product has been

distributed for use in retail and professional markets worldwide. In 2015, the sale of Milorganite® brought in close to \$9million in revenue, contributing more than 11% of MMSD's overall revenue needed to offset operating expenses, and providing a significant reduction of cost to rate payers.

With a focus on science based recommendations in growing plant life, agronomic research carried out by staff and thru relationships with many academic institutions has not only validated Milorganite's safety and benefits, it has changed turf science. Current research is being undertaken on creating additional value-added products, as well as determining the impacts and the remediation of emerging contaminants in biosolids.

MMSD's commitment to integrated watershed management that balances grey and green infrastructure necessitates the establishment of productive partnerships and intentional engagement with strategic stakeholders as well as on-going outreach to the general public. All major projects have robust outreach and engagement components and incorporate community input. MMSD's Neighborhood Green Infrastructure Program is implemented through partnerships with nonprofit organizations and neighborhood associations.

With two staff positions dedicated to outreach, MMSD engages in extensive outreach to the community through K12 school programs, professional development programs for teachers, facility tours, conferences and events, and an active speakers' bureau that presents to community, business, and professional organizations reaching over 26,000 people in 2015.

The 2035 Vision and Strategic Objectives set forth ambitious objectives for energy efficiency and energy generation and reuse -- meet a net 100% of MMSD's energy needs with renewable energy; meet 80% of MMSD energy needs with internal, renewable sources; use the Greenseams® Program to sequester 30% of MMSD's carbon footprint; and reduce MMSD's carbon footprint by 90% from its 2005 baseline.

MMSD's SeWeR: Sustainable Water Reclamation Plan (2012), written as a response to the 2035 Vision, further details the goals. The Energy Plan (2015) outlines and prioritizes energy-related actions to reach those goals. The 2050 Facilities Plan, currently in development, builds on those energy objectives -- be a zero energy user from outside sources and be an energy provider to outside sources.

The Facilities Department uses the Leadership in Energy and Environmental Design (LEED) for Existing Buildings Standard for the Headquarters and Lab buildings as the criteria for decisions on purchasing, maintenance activities, and operational changes. Recent vehicle procurements have resulted in more than a dozen compressed natural gas, hybrid, and electric powered vehicles.

MMSD directs significant resources to energy generation and recovery as well as to concurrent, rigorous planning to put in place actions that will enable MMSD to meet its sustainability and energy goals. Anaerobic digesters convert bio-solids to bio-gas that generate over 2/3 of the energy needed for the SS Facility. Waste heat captured during electricity generation at the JIWRP is then used to preheat the Milorganite® dryers, reducing energy needed for drying bio-solids. Landfill gas is cleaned and then piped 19 miles from a landfill to the JIWRP and converted into electricity, further reducing energy costs.

The 2020 Facilities Plan spurred development of major watershed initiatives in the region. Funding was secured by MMSD to develop watershed restoration plans (WRP) for the Menomonee and Kinnickinnic Rivers. Public engagement led to inclusion of goals related to habitat, accessibility, and aesthetics.

MMSD has initiated regulatory innovations advancing watershed initiatives for the region. MMSD led a partnership with EPA Region 5, WDNR, Southeastern WI Watersheds Trust, and municipalities in the Menomonee River watershed to develop a watershed-based, MS4 stormwater permit, the first successful such permit in the nation.

MMSD is developing 3rd party TMDLs and implementation plans for the Milwaukee, Kinnickinnic, and Menomonee Rivers and Milwaukee Harbor Estuary for fecal coliform, phosphorous, and sediment. Anticipated allocations will trigger new water quality initiatives and policies such as greater implementation of GI and potential establishment of water quality trading.

WDNR codified MMSD's integrated watershed management strategy to address water quality in MMSD's Wisconsin's Pollutant Discharge Elimination System (WPDES) permit requiring MMSD add 12 million gallons of GI capacity over five years. With no state order or federal consent decree pushing this requirement for GI, it is the first such requirement in the country.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

The 2050 Facilities Plan in development will be the first based on asset management principles; it is thought to be the first large-scale wastewater facilities plan to be based on asset management principles and may influence future regulatory requirements on how facilities planning is performed. The Facilities Plan will develop five Asset Management Plans for the five identified asset systems: Conveyance and Collections Systems, Water Reclamation Facilities and Biosolids, Watercourse and Flood Management, Green Infrastructure, and Administrative Facilities.

MMSD developed a Sustainability Policy (2009) that directs the purchase of products and services be based upon their environmentally preferable qualities including reduced toxicity, reusability, recycled content, functional efficiency, energy efficiency, and efficient packaging. The policy also states that the District purchase and use materials, products and services which are fiscally responsible, reduce resource consumption and waste, promote opportunities to lesser-advantaged segments of our community, perform adequately, and promote human health and well-being.

In the 2016-2018 Strategic Plan, "systems thinking" is incorporated into the approach to information technology strategies. Goals include: create a strategy for current and future storage allocation to

address handling growing data sets; create a procedure and schedule for the total life cycle management of software and hardware; and evaluate and develop a plan for end user equipment and hardware

In 2014, MMSD contracted with Brown and Caldwell to develop a climate change vulnerability analysis for the District. The objectives of the analysis were: 1) provide information for the District to make decisions on capital improvements and operational strategies in the face of changing hydrologic and climate conditions; 2) assess how soon climate change impacts may materialize at a level to present a meaningful threat to existing or planned facilities and operations; and 3) quantify risk that will aid in developing adaption strategies.

MMSD has a strong commitment to the Small, Veteran, Women, and Minority (SWMBE) businesses. In order to encourage SWMBE participation, the District established procurement goals of 13% for MBE's, 5% for SBE/VBE's, and 2% for WBE's.

MMSD's Regional Internship for Science and Engineering (RISE) program, established in 2011, matches talented college students from the region who are studying engineering and construction with District engineering, contractors and consulting firms for summer internship opportunities. The goal of the program is to attract and retain young talent in science and engineering from area colleges and District residents for employment in area businesses.

MMSD supports the M7 initiative -- a regional, cooperative economic development platform for the seven counties of southeastern Wisconsin: Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington and Waukesha. Its mission is to attract, retain and grow diverse businesses and talent. MMSD works with the M7 to recruit water-focused businesses and industries to the region through Metropolitan Milwaukee Association of Commerce.

MMSD started the Apprentice Readiness Program (ARP) program in 2005 in collaboration with the City of Milwaukee and Wisconsin Regional Training Program/BIG STEP to assist economically disadvantaged minorities, women, and youth develop the skills needed to participate meaningfully in the workforce and participate in the area economy while ensuring that member companies have the skilled workers needed to prosper and grow in a competitive global economy.

MMSD's Business Capacity Development program seeks to build the capacity and capabilities of small, veteran, women, minority, emerging and disadvantaged enterprises so that they may better compete for and successfully complete MMSD and City of Milwaukee contracts and projects. Over 20 courses are offered. In collaboration with more than 30 established businesses, organizations and mentors, program participants take part in customized training, assessments, coaching and mentoring.

Lunch in the Lab is a monthly event that provides an open forum for staff to discuss questions and dialog with the executive director and HR manager about policies and current projects as well as for the executive director to introduce new initiatives or to address other items of note.

In response to the shift to more transparent government, MMSD will review the potential for the District to provide more data resources to the public. The goal of the review of open data policies and trends is to identify useful information and determine cost effective methods in providing the data to the public.

Brown Bag Lunches are staff led and are opportunities for staff to present new research, topics of interest, reports from conferences, and project updates to assembled staff during the lunch hour. The Brown Bag Lunches also provide opportunities for staff to hone presentation skills and promote cross-department appreciation for the projects various departments are undertaking.

Coffee with Kevin (MMSD’s Executive Director, Kevin Shafer) is an informal gathering held on a bi-monthly basis. At this time, Kevin updates staff regarding policies, programs, and opportunities with engagement and questions from the assembled staff. This is also a venue for the introduction of new employees and for employee recognition.

Employee Connection is a representative body of employees elected bi-annually. The Employee Connection team provides: a medium through which recommendations and improvements pertaining to the quality of work-life and morale of MMSD employees may be presented to the Executive Director; a means through which activities to improve the quality of work-life and maintain high morale of all employees may be initiated and carried out; and a way to foster good relationships between MMSD and the local community by participating in food drives, fundraisers and other events.

Educational Reimbursement Program encourages its employees to continually develop their professional skills, make decisions regarding career opportunities, and prepare for career advancement within the District. All regular full time and part time employees are eligible to participate regardless of length of service.

MMSD’s established Wellness Program inspires employees to choose a healthy lifestyle both at home and at work to ultimately reduce the cost of healthcare insurance. By better managing chronic conditions and diseases and investing in the health and wellness of its workforce, the district will save money in the long-term.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Engagement of MMSD senior management in water-focused associations and collaborations to advance integrated water management both in the region and nationally	Data is collected for all outreach activities of District employees. In 2015, senior management delivered presentations, participated in panel discussions, or moderated events at over 28 state, regional and national conferences or meetings including the National Infrastructure Advisory Council, WERF, NACWA, WEF, WI Wetlands Association, Great Lakes Mayors Innovation Project/Great Lakes and St. Lawrence Cities Initiative, Natural Floodplain Function Alliance, and the American Society of Landscape Architects.
Participation continues in regional efforts of the M7 and the Water Council to attract water-focused businesses to the region	MMSD’s Executive Director serves on the board of directors for the Water Council; MMSD furthers the work of the M7 through funding support for its efforts
Meet enrollment goals for workforce development programs: Business Capacity Development program, RISE program, and Apprenticeship Readiness Program	Over 100 firms participated in the Business Capacity Development program in over 20 course offerings. An average of 15 individuals participated in the RISE program annually. Participation in the Apprenticeship Readiness Program with WRTP/BIG STEP resulted in 253 job placements with 58 being new apprenticeships.



Progress toward goals established for the 2016-2018 Strategic Plan for information technology	By 2018, criteria established and procedure developed for new IT acquisitions; draft strategy developed for data storage and handling; draft procedure and schedule developed for total life cycle management of software and hardware; evaluation complete and plan developed for end user equipment and hardware
Participation in Employee Assistance Program (EAP)	In 2015, 30 employees took advantage of services offered through the EAP.
Meet or exceed procurement goals for SWMBE/V program	MMSD has set an aspirational goal to award 20% of contracts to SWMBEs. In 2015, the goal was surpassed with 32.7% awarded and totaling \$15.4 million in contracts.
Goals for MMSD's Wellness Program is to increase "touches" with employees year to year	The program has seen a steady increase in touches beginning with 1464 touches in 2011, to 3166 touches in 2016.

### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Significant annual resources are directed to research the agronomics of Milorganite® to ensure its efficacy and consistency. Partnerships with universities are established in support of this activity and include the University of Florida, University of Georgia, University of Wisconsin-Madison, and University of Nebraska. Representative research topics include use of Milorganite® for the mitigation of pollutants and metals, testing its effectiveness in regional soils, and as remediation for turf problems.

A partnership with the municipalities of Shorewood and Brown Deer was formed to undertake a pilot study to determine the impact of Milorganite® on young trees in the urban landscape. If findings of a prior study are verified through the municipal pilot studies, the MMSD will promote the use of Milorganite® to enhance overall health, stormwater benefits, and performance of the urban forest canopy.

A study, Pyrolysis of Wastewater Biosolids – Biochar, is underway. The focus of the research is to: 1) produce and determine the basic composition of biochar and product fuel gas for several operating conditions; 2) develop a mass and energy balance for the drying and pyrolysis process; and 3) investigate the beneficial use of biochar for wastewater treatment and Milorganite® enhancement.

MMSD manages a dedicated website and social media platform and creates supportive collateral materials to provide in-depth information about Milorganite® and to promote its use by homeowners as well as for marketing to retailers and professionals. Brand promotion is geared to position the product as a value added product.

The marketing plan is updated annually to determine the mix of activities for product promotion taking in to account marketplace changes and trends, applying new tools and approaches necessary to engage with those in the profession and the marketplace.

New sales and inventory software has been implemented to increase efficiency for the Customer service coordinators.

Staff is active in advocating with regulators, consumers and industry in the benefits of biosolids as fertilizer and soil amendments.

#### *Performance Measures & Results*

- Goal of 98% of all biosolids beneficially reused: Of the close to 44,000 tons of biosolids produced in 2015 all went into beneficial reuse markets.
- Amount of product sold : Close to 44,000 tons were sold
- Revenue generated: In 2015 \$8.7 million in revenues was generated thru sales.
- Sustained competitiveness to other means of biosolids disposal (expressed as the revenue vs. expense ratio): In 2015, for every \$1 spent in the marketing and distribution of Milorganite \$2.50 was generated in revenue.

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

In 2014, MMSD piloted its Green Summers, a green infrastructure neighborhood outreach program in West Allis, Brown Deer, and Century Triangle Neighborhood in Milwaukee. The program focuses on increasing awareness of stormwater management and green infrastructure, promoting individual commitment to environmental stewardship, and the installation of residential green infrastructure practices. Its success and the subsequent award of a major Great Lakes Restoration Initiative grant will extend the program to an additional communities and neighborhoods between 2016 and 2018.

In order to address the significant problem of inflow and infiltration and the investment needed by private property owners to undertake the needed repairs, MMSD established the Private Property Inflow and Infiltration Program (PPI/I) in 2009 with funding allocations to municipalities within its service area. The assistance provide by the PPI/I program will reduce I/I and thereby reduce operating costs, capital program expenditures, and reduce the risks of overflows and basement backups. I/I remedies

include downspout disconnection, foundation drain disconnection, lateral repair, lateral rehabilitation and improved surface water drainage.

The 30th Street Greenway Corridor project, one of MMSD's major flood management projects, will mitigate surface flooding, reduce basement backups plaguing the area and improve water quality as well as contribute to a broader economic and community development initiative to revitalize the area. MMSD formed the Corridor Advisory Council comprised of a number of partners whose work is engaged in or is influential to the Corridor; engagement and input of these stakeholders are central to the success of this project. The plan calls for building three flood basins that will be dry until needed, will capture and store 40 million gallons of stormwater, reduce the risk of flooding, and incorporates aesthetic, recreational and safety concepts that neighbors desired, including usable green space.

GI will be a critical component to help meet the goal of eliminating all sewer overflows as stated in the 2035 Vision and Strategic Objectives. To further evaluate the potential of green infrastructure to help eliminate overflows, MMSD conducted a study in 2011 to assess the ability of a variety of practices to detain, evapotranspire, and infiltrate stormwater within the combined sewer service area (CSSA). The report,

Determining the Potential of Green Infrastructure to Reduce Overflows in Milwaukee, can be found at [www.mmsd.com](http://www.mmsd.com).

In 2012, MMSD contracted with the University of Wisconsin-Milwaukee Center for Economic Development to analyze the financial impacts of MMSD's green infrastructure (GI) strategies on property values for four selected study areas within the MMSD service area. The report, Impact of Green Infrastructure on Property Values within the Milwaukee Metropolitan Sewerage District Planning Area: Case Studies can be found at [www.freshcoast740.com](http://www.freshcoast740.com).

MMSD is a founding member of the National Science Foundation Industry/University Collaborative Research Center on water technology established in Milwaukee. The goal of the center -- one of about 55 NSF centers in the country and one of only two that focus on freshwater issues -- is to spur local economic growth by combining the engineering research expertise at UWM and Marquette with industry needs involving water equipment, policy and technology.

MMSD established a recognition program, Green Luminaries, to acknowledge businesses and organizations that have received partial funding for green infrastructure installations. The program highlights leaders, businesses, organizations, projects and programs that are advancing the use of green infrastructure and having a positive impact on water quality in the region. The Green Luminary, chosen monthly, is featured in a short video posted to MMSD's website and social media.

To encourage the installation of rain gardens on private properties, MMSD hosts an annual rain garden plant sale that provides plants at about a 50% discount compared to comparable retail plants and offers a free rain garden design workshop in partnership with UWEX Master Gardeners. Over 34,000 plants have been sold through this program.

In 2005, MMSD began a rain barrel program providing rain barrels at a reduced cost to District residents through a network of outlets and through MMSD's neighborhood GI programs. Over 23,000 rain barrels have been distributed to date.

MMSD has established a partnership with a nonprofit organization, Common Ground, and three area news stations and weathercasters to raise awareness about water usage during storms in an effort to keep excess wastewater out of the conveyance system. Water usage alerts will be broadcast during weather reports under certain conditions. The Water Drop Alert program is one of Common Ground's educational efforts in the region.

MMSD has developed a framework to establish an Adopt-a-River in the Milwaukee, Menomonee and Kinnickinnic Rivers and their tributaries as part of its efforts to engage the public in stewardship activities. The program is being managed through a partnership with Southeastern WI Watersheds Trust. The program will kick off later in 2016 and has already garnered interest from youth groups, schools, and businesses.

MMSD manages a hazardous household waste collection (HHW) program at three year-round sites and four annual mobile sites. The program has expanded with a partnership with Goodwill Industries enabling people to drop off unwanted but still usable items in a Goodwill collection area. The program collects approximately 1 million pounds of materials from roughly 14,000 residents, thereby helping to keep those substances out local rivers and tributaries.

In 2006, MMSD established one of the first pharmaceutical collection programs in Wisconsin, starting as an annual site-specific collection day and expanding to ongoing, weekday collections through unique partnerships with 17 police departments within the service area. The program is now managed locally by the individual municipalities. The program has collected 28.5 tons of pharmaceuticals from 2006 – 2015.

Tours are a significant outreach activity and conducted at the Jones Island Water Reclamation Facility, Milorganite® manufacturing facility, South Shore Water Reclamation Facility, labs, and on the deck of the R/V Pelagos. The tours draw a wide variety of audiences ranging from elementary school students to college classes to wastewater professionals.

#### *Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Increase participation in the rain garden plant sale program	Sales are tracked year to year with over 34,000 plants sold from 2006 – 2015 with 4,842 plants sold in 2015.
Increase participation in the rain barrel program	Distribution of rain barrels is tracked year to year with over 21,000 rain barrels distributed from 2004 – 2015 with 899 distributed in 2015.
Increase participation in Facility tours	In 2014, 4046 people participated in these tours; in 2015, 5460.
Outreach expanded to new stakeholder groups	Establishment of new partnerships with environmental education centers, faith-based organizations, and neighborhood associations and centers
Increase of participation in Hazardous Household Waste(HHW) collections and quantities of HHW collected	In 2014, 909,919 pounds of HHW was collected from 13,898 participants; in 2015, 832,357 pounds of HHW was collected from 12,933 participants.
Neighborhood participation through the Green Summers increase awareness of GI and increases installation of rain gardens and rain barrels.	In 2015, in West Allis, 12 house parties were held; tabled at 4 community events; and 50 rain barrels and 25 rain gardens were installed. In Brown Deer, 18 house parties were held; tabled at 15 community events; and 45 rain barrels and 3 rain gardens were installed
Community engagement the 30 <sup>th</sup> St. Corridor project continues and attracts new community and business stakeholders	IN 2015, 17 presentations were given for local groups and associations; outreach was conducted at 16 community events to promote residential GI; and 90 rain barrels and 8 rain gardens installed in ten neighborhoods in the Corridor. Additionally, MMSD staff attended 10 neighborhood association and partnership meetings for updates to the community on the project with over 296 individuals attending these meetings.
PP I/I programs are established and implemented by municipal partners through MMSD's PP I/I program	Municipal partners submit work plans, status, and required reports on status of the implementation of PP I/I programs. To date, 9200 investigations have been completed and construction projects on 6100 properties
Industry/business/university partnerships, advance knowledge in critical areas of study	On-going research will be undertaken with findings published and distributed to key stakeholders and in associated journals.
The Water Drop Alert program will build greater awareness of water use during storm events	MMSD will track the number of storm events that triggered the Water Drop Alert announcement on the broadcasts of the three participating local news channels and representative reach of each news program.

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

MMSD developed a sustainability plan, SeWeR: Sustainable Water Reclamation (February 2012) founded upon the 2035 Vision and an integrated, systems approach to problem solving with a sustainable bottom line as a guiding principle for planning, design and operational decisions. The sustainability plan outlines a comprehensive vision of which energy efficiency and energy generation and reuse are key components. Overarching goals for energy usage were set: 1) conserve energy through all capital projects by considering energy efficiency in all projects and operation and new decision-making tools and smart grid technologies and 2) seek renewable energy sources to meet energy needs through existing renewable energy projects, new sources of renewable energy, and consider ways to support innovation in the field.

In alignment with the sustainability policy for procurement, recent vehicle procurements have brought more than a dozen vehicles onto the fleet using advanced and alternative fuels: compressed natural gas, hybrid gas/electric, and electric.

A comprehensive Energy Plan was completed January 2016 that details and evaluates viable pathways by which MMSD could achieve net energy independence by 2035. The plan outlines how MMSD's energy goals can be achieved through a combination of demand-side management and energy generation alternatives.

Baseline study of energy use and progress to date toward achieving MMSD's goals was undertaken as part of the Energy Plan, the gap between existing energy use and the goals was quantified, and 95 alternatives to bridge the gap identified. The 95 alternatives were then prioritized using monetary and nonmonetary criteria with 37 determined to be most effective with 19 recommended for further planning evaluation for potential implementation.

The Energy Integration Team was formed in 2010 to advance recommendations detailed in the Energy Plan. The team meets every six weeks and reports on progress to goals, research, and actionable updates to Energy Plan spreadsheet. The interdepartmental team includes staff from Technology Services; Milorganite®; and Planning, Research and Sustainability Departments and staff from MMSD's contracted operator, Veolia Water Milwaukee.

An assessment of MMSD's progress toward the WEF Energy Roadmap characteristics was conducted in a workshop as part of the development of the goals and objectives for the Energy Plan.

MMSD has implemented a metering project with the installation of approximately 40 power monitors on electrical gear at JI WRF and SS WRF, grouped by priority, which will provide data to assist in developing an accurate electrical consumption distribution profile that can be analyzed through time and space. The data will provide the necessary information to increase the confidence of optimization efforts and capital project assessments aimed at improving facility efficiency.

A Hach Wims Based Energy Dashboard was developed for Jones Island and South Shore Energy Management. The Energy Dashboard will give daily, hourly and monthly data for fuel and electricity used, generated and purchased as well as the ability to monitor the quantity and quality of landfill gas and digester gas. In addition, a comprehensive energy and greenhouse gas data management tool for predictive and scenario-based decision-making in planning/design for about 5 years came on line in the first quarter of this year.

MMSD contracted with CH2M in 2010 to conduct a greenhouse gas (GHG) inventory that included the District's water reclamation facilities, conveyance system, and other related District-owned and controlled facilities and programs. The inventory was undertaken in support of MMSD's commitment to consider the depletion rate of nonrenewable resources and use those resources in the most productive and beneficial way possible to forestall or avoid complete exhaustion of those resources. The GHG inventory provides the District with information to develop future strategies for efficiently managing those resources that produce GHG emissions and will be able to be updated once the data management tool mentioned in the prior box entry is launched.

A project is underway to improve the efficiency of the lighting system at the Jones Island and South Shore Water Reclamation Facilities. All existing indoor and outdoor lighting will be evaluated for possible upgrade if the upgrade will positively impact energy savings, maintenance, and labor productivity.

JIWRF Aeration System Upgrade Capital Project replaced 5500 horsepower (hp) 40 year old process air compressors with a new 4500 hp Siemens high efficiency STC-SO SF014.0 single stage compressor. The new compressor has operated most of the time since early 2015. The new Siemens compressor installation includes a Siemens 4500 hp variable frequency drive, which allows the compressor to operate at high efficiencies over an output range of 55,000 scfm to 103,000 scfm.

#### *Performance Measures & Results*

- Decrease in energy demand with installation of new, energy efficient Process Air Compressors (PAC): Tracking of energy savings: old PAC used 31 Kw/scfm; new PAC uses 26 kw/scfm; KW/month for old Vs new PAC 3 MW to 2.5 MW; MW Plant Electric Load (Dry Weather) Old PAC 11 MW, new PAC 10 MW.
- Impact on fuel savings from use of alternative fuel vehicles and "eco-driving" training for field staff: First year of these combined programs saved MMSD \$4000.
- Reduction of greenhouse gas (GHG) emissions: Recommendations from the energy calculation and GHG scenario planning tools will be considered and implemented as warranted and data collected to track the subsequent reduction of GHG.
- Continue feasibility studies for 19 prioritized recommendations/actions detailed in Energy Plan to meet 2035 Vision: The Energy Integration Team will continue to meet every six weeks for progress reports on prioritized recommendations and to detail next steps.

#### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Using “waste heat” as renewable energy, MMSD captures heat off the engine generators at the South Shore facility and use it to heat anaerobic digestion. At the Jones Island facility, heat is also captured from the generators and used to pre-heat the Milorganite® dryers.

In 2010, MMSD’s Commission adopted the 2035 Vision and Strategic Objectives that include ambitious goals related to energy and efficiency renewable energy: meet a net 100% of MMSD’s energy needs with renewable energy sources; meet 80% of MMSD’s energy needs with internal renewable sources; use the Greenseams® Program to provide for 30% sequestration of MMSD’s carbon footprint; and reduce MMSD’s carbon footprint by 90% from its 2005 baseline.

To increase the quantity of methane gas produced as a by-product in the anaerobic digesters at the South Shore facility, MMSD is working to attract additional sources of high strength waste to boost its production in order to generate all electricity from biogas. Electricity generated from methane capture and reuse YTD has provided 71% of South Shore’s electricity requirements.

Through an innovative project, MMSD is using methane gas, waste gas from a local landfill, to generate electricity for its Jones Island Water Reclamation Facility. Methane gas is piped 19 miles from Emerald Park Landfill to the Jones Island Water Reclamation Facility (JIWRF) where it is converted to electricity in three Solar Turbines with a typical output of 4 – 5 MW.

An additional contract for sourcing landfill gas has been secured to provide a secondary source of methane gas to augment the Emerald Park contract in order to increase amount of electricity produced using biogas at the JIWRF. The turbines have the capacity to power all operations at JIWRF when adequate supply can be delivered.

MMSD’s use of solar energy includes a 20 kW installation at Jones Island, a 15 kW installation at Headquarters, on this building, and solar hot water at the lab. A real-time performance dashboard is displayed in the lobby.

MMSD contracted with Pirnie/ARCADIS to conduct a study concerning Sewer Thermal Energy Recovery. Five technologies were assessed by their physical requirements, need/opportunity for pre-treatment, cost, and

Reliability. GIS was used to identify high candidate locations by sewer-shed and land use criteria. A Triple Bottom Line Technology Comparison Tool was used to evaluate the five selected technologies.

The Headquarters and Lab Heat & Power Generation System project began in January 2016 with preliminary engineering. The scope of the project is to implement a Combined Heat and Power Generation System at MMSD headquarters and Laboratory buildings that will self-generate electrical power while utilizing the waste heat recovered for heating and possibly cooling and producing essentially near-zero GHG emissions.

### *Performance Measures & Results*

Data for 2015

- % Electricity Generated at JIWRF: 90%
- % Electricity Generated by LFG at JIWRF: 26%
- % Run Time of the Solar Turbines JIWRF: 74%



- LFG Used (dth): 230,460
- Sequester 30% of MMSD's carbon footprint through Greenseams® acquisitions: 7.9% progress toward goal
- % Electricity Generated at SSWRF: 42%
- % Electricity Generated by DG at SSWRF: 42%
- % DG Flared SSWRF: 23%
- DG Produced SSWRF (mmcf/day): 1.31
- % Run Time of CAT Engines SSWRF: 55%
- Continued funding of green roof projects in the Service Area not only to mitigate stormwater, but also to sequester CO2: To date, 11.6 acres of green roofs have been funded through MMSD's partnership funding program. It is estimated that these green roofs will sequester 38,810 pounds of CO2 per year.

### **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Greenseams® is a flood management program developed in partnership with The Conservation Fund that works to retain stormwater and to reduce the risk of future flooding problems while providing multiple benefits to the local community in the form of open space, wildlife habitat, and passive recreation. Undeveloped parcels are purchased from willing landowners to conserve and protect hydric soils, wetlands, stream corridors and other natural habitat; opportunities are then taken to restore the preserved landscape to a more native condition. Since its inception in 2001, over 3142 acres of land have been protected.

A newly funded program, Working Soils®, aims to improve soil health and reduce the risk of flooding in the Milwaukee River Watershed through the preservation of prime farmland through working with willing landowners to acquire agricultural easements on priority land within the watershed. Participating landowners work with program partners; local land trusts, Natural Resource Conservation Service, the Conservation Fund, and County Land and Water Conservation Departments to develop a conservation Plan and explore the various Environmental Quality Incentives Program practices to improve soil health and water retention.

The Green Solutions program provides funding to municipalities for Commission-approved types of GI and combined sewer separation projects. The program provides financial incentive to District municipalities to help achieve future TMDL compliance while also progressing towards the District's

2035 Vision's goals related to integrated watershed management (IWM), the District's Regional Green Infrastructure Plan, and the District's WPDES discharge permit.

Green Infrastructure Partnership Program, an annual funding program, seeks to increase GI implementation and innovation within the service area. The selected projects provide the MMSD with information related to GI effectiveness, costs, feasibility and maintenance and demonstrate progress toward meeting the District's Wisconsin Pollutant Discharge Elimination System (WPDES) permit requirement of adding 12 million gallons of green infrastructure capacity over five years. Proposals must include detailing of how each project addresses the MMSD's triple bottom line goals.

The Menomonee Low Grade Barrier Project, one of over 25 Watercourse Projects, will remove five man-made barriers to fish passage in the Menomonee River channel in order to improve hydraulic function aquatic connectivity and habitat along more than 34 stream miles. The five channel locations will be modified through bioengineering to restore natural hydraulic function and to improve habitat by mimicking the pool and riffle sequences of the natural river system.

An Integrated Regional Stormwater Management Plan is in development. The goal of the plan is to improve stormwater management within the region by integrating stormwater runoff issues with flood management to improve both drainage and water quality. The plan will identify and inventory noted drainage problem areas situated near potential floodplain relief locations, evaluate alternatives that provide both a WQ improvement and water quantity drainage solution, and suggest a recommended plan with associated costs.

The MMSD secured an EPA technical assistance award to prepare an implementation plan for the operation and maintenance (O&M) of green infrastructure (GI). The project took a holistic approach to O&M for GI, considering the needs of the region's municipalities, best practices for operating and maintaining green infrastructure, job opportunities and associated training needs and likely sources of potential funding. The results of the study are foundational to MMSD's current work to define regional GI needs for O&M.

In 2012, MMSD piloted the Alliance for Water Stewardship's (then) 12-step standard for water stewardship at MMSD headquarters and labs. The refined 6-step standard was also piloted by Veolia Water Milwaukee, MMSD's contracted operator, at the Jones Island Water Reclamation Facility and South Shore Water Reclamation Facility.

A continuous water quality monitoring system is in place at 16 sites throughout the Greater Milwaukee River system using multi-probe sondes. Testing, modeling, and analysis obtained through this effort will provide data to monitor the success of the Menomonee River MS4 watershed-based stormwater permit and implementation of the TMDLs.

The River Skimmer Program, a collaborative undertaking between MMSD, the City of Milwaukee, Milwaukee Christian Center, and Veolia Water Milwaukee. The skimmer collects surface debris from early spring to late fall in the Milwaukee River helping to protect habitat and enhance recreational activities. In 2015, 1292 cubic yards of debris were collected as well as numerous trees.

Through a partnership with 1000 Friends of Wisconsin, Birchline Consulting LLC, Milwaukee County, and 27 municipalities contracted with MMSD; municipal codes and ordinances were audited for barriers to green infrastructure. Recommendations and priorities were developed for each community in preparation for forthcoming TMDLs and in support of the MMSD Regional Green Infrastructure Plan.

To future the directives of the 2020 Facilities Plan and the Regional Water Quality Management Plan Update, in 2004, MMSD organized the region’s first watershed-focused conference, the Clean Rivers, Clean Lake conference, bringing together businesses, local government, WDNR, environmental NGOs, and other individuals interested in the restoration of local waterways and protection of those resources and Lake Michigan. Workshops, presentations of signature water quality and restoration projects, and updates regarding scientific research and rising issues comprise the program for the conference. The conference is now managed by Southeastern WI Watershed Trust with MMSD’s continued involvement in support, planning, and presenting.

MMSD is undertaking a project to collect data needed for the development of an Oak Creek Watershed Restoration Plan. The project is in support SEWRPC’s development of a restoration plan for the watershed. It will focus on areas including water quality, recreational access and use, habitat conditions and targeted stormwater drainage and flooding issues.

High level planning is underway to develop a green infrastructure service center that would be a point of service for information and training for green infrastructure.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
The number of land parcels acquired and protected through the Greenseams® will increase with additional acres restored	To date, 102 properties have been acquired with 3197 acres permanently protected. Of these acres, 600 have been restored; additionally, 100,000 trees have been planted.
Outreach efforts for the Working Soils® targeting farm owners in the upper Milwaukee River watershed with the goal to secure its first group of land owners to participate in the program.	An outreach plan will be developed to promote the program in strategic locations throughout the project area. Through these events, interested farm owners will be identified for the first cohort of partners for the program.
New green infrastructure projects will be installed through MMSD’s funding program, Green Solutions	Competitive proposals for GI projects submitted by diverse stakeholders will be selected for funding through the Green Solutions program and project reports submitted upon completion.
Municipalities will participate in MMSD’s GI Partnership Program resulting in more GI installations throughout MMSD’s service area	Participation will increase with municipalities taking full advantage of the allotted funding awarded to their respective communities for GI projects. Municipalities will reports on GI Partnership Program projects. MMSD will track impact on GI capture goals.
Removal of the 5 low-grade barriers in the Menomonee River will result in increased hydraulic function, aquatic connectivity, and habitat	After the project is completed, data will be collected to determine the impact on these parameters.
The proposed GI Service Center (GISC) will advance to the next level of planning	Scope and supportive documents for the GISC will be developed for review
MMSD will move closer to its goal of capturing the first ½ inch of rainfall on impervious cover in its Service Area or 740 million gallons through its suite of GI programs	Data for gallons captured will be reported by each GI program including Green Summer, GI Partnership Program, Green Solutions as well as additional GI projects with the District’s municipal partners

## Monterey Regional Water Pollution Control Agency CA



### Monterey Regional Water Pollution Control Agency CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Community Partnering & Engagement



Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.):		
Service Area (square miles): 90.5	Average annual daily flow (MGD): 17.6	
Population Served: 268,600		
Location		
Street Address: 5 Harris Court, Bldg. D		
City: Monterey	State: CA	Zip Code: 93940
Contact Information		
Name: Stephen Hogg	Phone: (831) 883-1118	Email: Stephen@mrwpca.com

**NARRATIVE:** The Monterey Regional Water Pollution Control Agency (MRWPCA) is more than just a wastewater agency: it is an environmental steward, dedicated to meeting the wastewater and recycling needs of its member agencies. Moreover, the MWRPCA aims to provide the highest quality of customer service in the pursuit of the efficient, innovative utilization of wastewater.

In order to effectively address this regional problem, the MRWPCA has realized the importance of inter-agency cooperation and coordination. To this end, the MRWPCA has taken the lead in developing numerous agreements and contractual arrangements necessary to better utilize diverse, albeit unorthodox, water resources. Pure Water Monterey (PWM), the embodiment of these efforts, has included contractual arrangements with nine different local organizations in addition to approval by no less than twenty-one different local, State, and Federal agencies.

Beyond the staggering degree of collaborative effort exercised by the Agency, the most unique aspect of Pure Water Monterey is the innovative use of traditionally overlooked water sources. The program will aggregate and purify municipal wastewater, stormwater, agricultural wash water, and tile drain water from impaired agricultural drainage ditches to be used for agricultural irrigation and indirect potable reuse.

Speaking to its spirit of cross-collaboration, the Agency has implemented a strategic planning process that not only includes the Board of Directors, but also representatives of each level of the management team and representatives from each labor group. Every six months, this group convenes to review the progress of tactics ascribed to each strategic focus area adopted by the Board, and to validate the relevance of each tactic. In addition to this peer-review evaluation, the progress of these actions taken is routinely reviewed with the Board of Directors.

Borne out of the strategic planning process described above, the IT Steering Committee (ITSC) is tasked with implementing the recently-drafted IT Strategic Plan. The ITSC, comprised of representatives of a variety of work groups across the Agency, convenes on a quarterly basis to set and discuss milestones towards reaching its goal.

In an effort to attract, develop and retain exceptionally knowledgeable and skilled staff, the MRWPCA has implemented several innovative programs. Most recently, the Operator-in-Training Internship Program was incepted and established by the collective efforts of Operations and management staff. In sum, the Agency has partnered with a local community college to develop a pool of well-qualified candidates for future recruitments. Gavilan Community College provides classroom training for water and wastewater related topics, while the MRWPCA provides the hands-on experience and certified wastewater operators as mentors. This program hits a triple bottom line of sorts: it provides an education in the wastewater industry, work experience required for State certification, and provides the Agency with skilled labor at little cost.

Ultimately, the MRWPCA is dedicated to ensuring financial stability, sustainability, and stewardship of the organization for its rate payers and member agencies. This responsibility is addressed through the development of a ten year financial plan, associated ten year capital improvement program, and a multi-year rate plan. To solicit input regarding these efforts, the Agency is concurrently developing facility master plans for the Regional Treatment Plant (RTP) and its extensive network of pump stations and force mains. Additionally, the Agency has purchased and begun implementation of a new Computerized

Maintenance Management System (CMMS) that will serve as another major component of its Asset Management Program.

**ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Conducted all-day training workshops for employees to gain interpersonal, time management and coaching skills	Four workshops conducted during FY15/16
Utilized new technologies to optimize HR practices including recruitments, data retention, tracking, analytics, performance management and training	Implemented new applicant tracking software, NeoGOV
Developed five-year IT Strategic Plan including IT governance	Plan completed and presented to the Agency Board March 28, 2016
Received State and National recognition for the Agency’s Budget and Comprehensive Annual Financial Statements	California Society of Municipal Finance Officer’s Operating Budget Meritorious Award for Fiscal Year 2015/16  Government Finance Officers Association (GFOA) Certificate of Achievement for Excellence in Financial Reporting  Special District Leadership Foundation Transparency Certificate of Excellence Award
Cross-training of a Customer Service Representative to conduct tours of Agency facilities	Training of one Customer Service Representative completed
Develop Succession Planning Checklist for management positions in the Operations Department to facilitate training and enrichment of internal staff for promotion	Four operators are currently proceeding though the Succession Planning Program

## COMMUNITY PARTNERING & ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

### *Performance Measures & Results*

- Water Quality and Operations Committee- monthly, open forum held to discuss matters pertaining to the jointly owned and operated Salinas Valley Reclamation Project (SVRP), Castroville Seawater Intrusion Project (CSIP), and Salinas River Diversion Facility (SRDF): Monthly open forum meetings with continuous attendance by key program stakeholders
- Triple Bottom Line analysis of Pure Water Monterey Groundwater Replenishment Project (2014) A physical report reviewing the project using the Triple Bottom Line approach
- Participation in various groups to address regional issues (e.g. stormwater, groundwater management): Participation in regional programs and increased collaboration
- Official Agency Twitter and Facebook established with weekly activity centered on Agency news, projects, and community events: A growing number of ‘followers’ and ‘likes,’ a social media policy developed and pending Board approval, a new line of communication established between the Agency and its constituents.

## WATERSHED STEWARDSHIP

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Collaborating with multiple partners for a regional water supply project that enhances water recycling, infrastructure maximization and improved regional collaboration.

Working with partner agencies to provide green energy (solar and biogas) for pump station and treatment plant operation and reducing overall carbon footprint.

Pure Water Monterey will utilize diversion structures to remove pollutant-laden water from sensitive aquatic habitats and deliver it to the Advanced Water Treatment Facility, where it will be purified and used for groundwater recharge.

Robust plans for operation, repair, and maintenance of pumping and treatment systems are currently underway to address climate change implications.

*Performance Measures & Results*

- Measure flows of alternative waters: Requiring each new alternative water to have a dedicated flow meter
- Costs to treat alternative waters: Implemented Interruptible rate for alternative water sources:
- Estimated pollutant load reduction: Utilize water quality tests and flow meters to verify the amount of pollutants saved from entering the sensitive aquatic habitats
- Lower traditional energy usage for treatment: Using green energy to reduce traditional power costs
- Reusing existing infrastructure for beneficial use: Repurposing wastewater treatment ponds to accept stormwater for storage for beneficial reuse



## Murfreesboro Water & Sewer Department TN



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### Murfreesboro Water & Sewer Department TN

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Water Reuse
- ★ Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Type Sinking Creek Wastewater Treatment Plant		
Service Area (square miles): 237.27 SQ MI	Average annual daily flow (MGD): 16 MGD	
Population Served: 125,000		
Location		
Street Address: 2032 Blanton Dr.		
City: Murfreesboro	Zip Code: 37129	
State: Tennessee		
Contact Information		
Name: John Strickland	Phone: 615-848-3225	Email: jstrickland@murfreesborotn.gov

## **NARRATIVE: Organizational Culture**

The City of Murfreesboro is one of the fastest growing and most progressive cities in the State of Tennessee. City leaders are meeting the challenges that growth brings and have endeavored to proactively manage this growth while incorporating the latest technology where appropriate into the various departments that serve the public. Adopting the motto, "Creating a Better Quality of Life", the Mayor and City Council have embraced it as the mission of the city government. In concert, the City Manager espoused a "Good to Great" initiative based on the Jim Collins book by the same name.

Within the Water and Sewer Department (MWSD), this is evidenced by the early and effective adoption of the Effective Utility Management (EUM) model as a guiding set of principles (5 Keys to Success) and goals (10 Attributes). As a supplier of products and services that are vital to life and foundational to our quality of life, MWSD recognizes and embraces the responsibility and role we play in sustaining our community and its environment; and take seriously the public trust we must gain and maintain. Every initiative, every action, every decision, and every dollar expended is evaluated through the EUM lens. Does the decision or action address, enhance, or achieve at least one of the following: Product Quality, Customer Satisfaction, Employee and Leadership Development, Operational Optimization, Community Sustainability, Financial Viability, Enterprise Resiliency, Infrastructure Strategy and Performance, Water Resource Sustainability, or Stakeholder Understanding and Support.

To date, the EUM mindset has been instrumental in MWSD becoming:

- a learning organization where staff is encouraged and budget is allocated (300% increase) to develop the skills to stay on the cutting edge of technology. Staff attendance in professional development classes and conferences, visits to other plants, pursuing certifications, and research and study are growing. Zero cost internal training is on the rise with senior staff mentorships of new and less experienced staff along with Supervisor Training provided by our own City Human Resources, Legal, and Risk Management experts.
- more intentional in promoting from within and in external hiring practices. Hiring well is paramount and MWSD understands that every hire is potentially a million dollar decision which will impact decades to come.
- an organization that understands and embraces taking calculated risk. The willingness to make significant plant operational changes that have a reasonable probability of improving product quality, reducing cost, or enhancing enterprise resiliency etc. are possible because honest failure is not punished. It is understood that challenging projects will not always succeed, thus, if honest, good faith efforts are given all around; no time is wasted seeking to assign blame.
- a team, understanding that there is no need to claim ownership of ideas. Teams evaluate all ideas, select the best one, and commit to it. This process leads to the greatest likelihood of success, team victories to enjoy, and no one suffering failure alone.
- facilitators of partnerships with far reaching impact. Relationships have been established and enhanced with stakeholders from across the state including an extensive network of state regulators, industry experts, and university faculty. An example is our partnership with Middle Tennessee State University where a new degree offering in Water Resource Management was developed. MWSD participated in curriculum development and will provide internship opportunities for students pursuing this degree

- proactive. Reactive maintenance has been replaced by systematic data analysis which guides preventive maintenance. The infrastructure strategy of maximizing asset longevity is made possible by this approach. Data never collected before is now systematically collected. Records that were rarely analyzed are now regularly reviewed. Research is conducted on replacement parts, alternative operations, and creative ways to extend life cycles. Again, it's all about the EUM mindset.

#### Water Reuse

In the early 2000's Murfreesboro stood in a place very similar to where we stand today. Existing and anticipated growth in Rutherford County and Murfreesboro was and continues to be a recognized economic engine for the State of Tennessee. Substantial economic and population growth continues at a rapid pace, thus demanding that planful, strategic, and sometimes politically sensitive and expensive decisions be made. Our challenge was finding environmentally and politically acceptable avenues for disposing of the treated effluent from our Sinking Creek Wastewater Treatment Plant (SCWWTP).

The City's effluent receiving stream is the West Fork Stones River (WFSR). The WFSR has for many years been a 303d listed stream; impaired for sediment, nutrients and low dissolved oxygen. With a central wastewater treatment plant having its sole outfall on the WFSR, Murfreesboro would ultimately be limited by the stream's assimilative capacity. Therefore, in order to ensure the long-term socioeconomic viability of area, a more progressive and innovative strategy was and continues to be a vital objective in achieving true sustainability.

Our approach began with the purchase of two farms (201 and 408 acres) in 2002 and 2003. The purpose of the farms was for dedicated land disposal via irrigation of highly treated effluent. MWSD then began construction of a repurified water distribution system which now consists of two (2) elevated tanks (0.5 and 1.5 MG), 25 miles of repurified water line, 250 valves and 144 meters. The system provides irrigation water to the farms, our local golf course and soccer complex, multiple City-owned landscapes and more than 100 private customers. One customer, a new apartment complex, installed plumbing for repurified water into their apartments to accommodate toilet flushing.

From 2011-2016, the annual average daily flow of repurified water for irrigation and other purposes ranged from 3.3-4.5 MGD, representing 22.4-28.7% of our treatment plant effluent flow.

By partnering with key stakeholders, the City charted a way forward to not only achieve sustainability in wastewater effluent management, but do it in a way that integrates the full array of water resources available within the watershed. Additionally, as sustainability strategies were derived, the City continually focused on maintaining affordability as a co-priority for its customers.

The ongoing challenge is working within the existing regulatory framework to meet the immediate expansion needs of the SCWWTP, and developing a reliable "bridge" between pragmatic, proven approaches and the regulatory community's permitting "box". Fulfilling the mission of enduring sustainability (i.e., 50+ years) to meet the watershed's long-term water needs requires a fully integrated watershed approach.

#### Watershed Stewardship

Authentic Watershed Stewardship consists of intentional actions to maintain and hopefully improve water quality in the watershed. In the early 2000's, WFSR Segment 3000 was 303d listed as impaired

due to sediment, nutrients, and low dissolved oxygen. Since then, MWSD has implemented the following projects and actions specifically directed at improving water quality in the Stones River Watershed.

- Expansion of capacity and capability of the SCWWTP to include oxidation ditch activated sludge, tertiary filters, ultraviolet light disinfection, post aeration, and solids dewatering.
- Operational modifications to aeration of the oxidation ditch to optimize nitrification, denitrification, and phosphorus removal by luxury uptake.
- Regulatory overview through passage of three City ordinances (2005-2008) addressing site control runoff, stream buffers, and post construction stormwater treatment, and imposed a stormwater user fee in 2007 to fund stormwater management projects
- Construction site permitting and inspections including issuance of 457 Land Disturbance Permits (LDPs) from 2008-2015, of which 228 LDPs (est.) encompassing 1341 acres were on the \_3000 segment
- Corrective actions in the field including location and mitigation of 13 illicit discharges in the WFSR \_3000 watershed (2008-2015). Sources included food vendors on Square; truck washing at truck repair business; gas station/markets
- Post-construction stormwater control measures (SCMs) including installation of sediment removal and flow control facilities at 64 sites totaling 735 acres in the WFSR \_3000 watershed
- Street sweeping, initiated in 2009, has collected 6554 tons of material including 3211 tons from the WFSR \_3000 watershed. An additional 820 tons of material has been vacuumed from storm sewers
- Education and public participation events in the 2008-2015 period including
  - Tree Days encourage planting of trees alongside streams
    - Lytle Creek (2010, 2014); 235 riparian property owners rec'd information; 1800 trees distributed
    - Upper WFSR (2013); 134 property owners received mailer; 600 trees distributed
    - Educational brochures on stormwater runoff management practices mailed to restaurant operators (375), landscaping companies (15), and pressure washing businesses (9)

These actions have produced dramatic improvement in SCWWTP effluent quality and WFSR water quality. Semi-annual hydrologic and biological assessments of the WFSR initiated in 2013 have shown significant improvements in stream health as measured by the Total Macroinvertebrate Index (TMI). Results reported to the State in 2015 are expected to result in a delisting of perhaps 2 stream segments of the WFSR from the 303d list.

The City is continuing its proactive approach to growth management, initiating the development of a 20 Year Comprehensive Plan (Murfreesboro 2035) in 2015. In concert, MWSD has commissioned the development of a Water Resource Integration Plan (WRIP) as a companion study. The WRIP will:

- Look holistically at the management of water (drinking water, wastewater, repurified water, and stormwater) within the potential service areas of the MWSD;
- Coordinate with the City's Comprehensive Plan, so that the goal of facilitating growth will encompass affordable and sustainable water management.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

The city manager’s Good to Great initiative is a clear commitment to organizational excellence.

Implementation of the Effective Utility Management system.

Succession planning that ensures Enterprise Resiliency and staff’s preparedness to take on new responsibilities as positions come open. All positions are to be “3 Deep” i.e. three individuals have demonstrated competency for all positions and responsibilities.

Adoption of the city’s Customer Service Excellence program. The operations staff and several others have won the program’s highest honor: the STARS Awards for outstanding service.

Intentional practice of the EUM key to success Knowledge Management. Organizational barriers are removed to allow the free flow of information. Mentors are utilized and intuitional knowledge is compiled.

### *Performance Measures & Results*

- Funding for Training: Increased 300% from \$7,000 to \$28,000
- Total Annual Staff Training Hours: Increased over 100% from 310 to 640
- % of Promotions from Within: Increased from 67% to 86%
- % of Operators with Extra Certification: Increased from 0% to 64%
- % of Operators with the highest level of Treatment Plant certification: Increased form 45% to 82%

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

Water Resource Integration Plan underway which will provide a 20 yr roadmap to overall water management within the urban growth boundary including stormwater, wastewater, drinking water, and reuse water

Ongoing search for industrial/agricultural partnerships for reuse water

Ongoing public education regarding the value and quality of repurified water e.g. annual Earth Day booth, plant tours for numerous civic and school groups, etc.

Case by case evaluations of reuse infrastructure extensions to service new and existing residential/commercial developments

Ongoing and expanding water quality analyses of reuse water with samples a collected at multiple locations

#### *Performance Measures & Results*

Ratio of reuse quantity vs. wastewater volume processed: 23-29% over the past 6 years

- Area irrigated solely by recycle water: >1000 acres
- Reduced dependence on purchased water and energy used to treat purchased water: Drinking water supply, treatment, and distribution requirements reduced >20% , saving users >\$3M annually
- Reduced Waste Load to WFSR from BOD, Total Nitrogen, and Phosphorus: Annual reductions in waste load to river of BOD(18 tons), Total Nitrogen (12 tons), and Phosphorus (12 tons)
- Aesthetic Improvements: City landscapes, golf course, and soccer complex are beautiful

#### **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)

#### *Performance Measures & Results*

- Water Quality Impacts: As described in the narrative, the collective impact of the substantial projects, investment, and operational practices and activities undertaken over the past two decades have dramatically improved water quality in the Stones River Watershed. Segments of our receiving stream which have been classified as “impaired” for decades are soon to be delisted.

## Narragansett Bay Commission RI



### Narragansett Bay Commission RI

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Multiple plants		
Service Area (square miles): 69.1 for both plants	Average annual daily flow (MGD): 56.4 (2015)	
Population Served: 360,000 – 40% of the State; 8,000 commercial and industrial customers		
Location		
Street Address: 1 Service Road		
City: Providence	State: RI	Zip Code: 02905
Contact Information		
Name: Thomas Uva	Phone: 401-461-8848	Email: tuva@narrabay.com

**NARRATIVE:** The Narragansett Bay Commission (NBC), Rhode Island’s largest wastewater authority, believes that wastewater treatment facilities are responsible for much more than just treating sewage to meet permit limits and protect public health. In today’s world of clean water agencies, it is the NBC philosophy that we have a responsibility to exceed permit limits, to improve and enhance our environment, to routinely evaluate the quality of our receiving waters and share that information, to base our management decisions on sound science, to conserve our valuable resources, reduce our energy usage and greenhouse gas emissions, and ultimately generate all our energy needs with renewables. We routinely share our expertise in these fields with sister agencies, our neighboring communities and through our extensive education programs with our stakeholders. The NBC can never stop planning, never stop advancing and never stop improving as we strive to achieve our lofty goals while ensuring that sustainability and the triple bottom line are incorporated into our management decisions. The Narragansett Bay Commission is truly a Utility of the Future.

This organizational philosophy has created a strong culture that drives excellence from our employees to achieve a high level performance and to take the risks necessary to implement innovative out-of-the box ideas. This employee innovation has received consistent support from our Board of Commissioners, a board comprised of representatives from the Governor’s office and local communities, and with board support and employee innovation, the NBC has become a national environmental leader. This was clearly demonstrated over the past several decades as the NBC turned one of the worst treatment plants in the nation into an EPA award winning facility recognized as the “Best in the Nation”!

The NBC has progressed from being managers of wastewater plants, merely complying with permit limits and the Clean Water Act, to becoming the managers of valuable resources and trailblazers of innovation. The NBC has embraced positive changes and has made great strides in not just surpassing permit limits, but improving infrastructure with the latest technology, employing innovative solutions to enhance water quality, reducing energy costs, producing renewable energy, and ultimately protecting and enhancing our local waterways. The NBC has implemented a program for beneficial reuse of 100% of our biosolids to generate renewable energy and we reuse treated plant water at our facility and are evaluating and encouraging treated water reuse by other entities. We have measured our carbon footprint and greenhouse gas emissions from our treatment tanks, and are evaluating and implementing many programs to reduce them. We monitor and improve the quality of our receiving waters and work with regulatory agencies and stakeholders as stewards of our watershed. We are part of the solution, not just the polluting wastewater plant that is typically considered in many communities across the nation to be the source of the problem. By implementing these efforts the NBC has cemented its role as an agency that accomplishes great things and is part of the solution, earning a reputation as a local and national leader in wastewater treatment, energy efficiency, alternative energy and water quality assessment and enhancement. The NBC has done all of this while keeping costs low for ratepayers.

The NBC’s mission and long-term vision is to “maintain a leadership role in the protection and enhancement of water quality in Narragansett Bay by providing safe and reliable wastewater collection and treatment services at a reasonable cost”. In a radically changing and challenging environment, the NBC is dedicated to continuous improvement of treatment operations while empowering its workforce to “think outside the box” to implement innovative ideas in everyday activities as well as major projects to enhance environmental performance. The organization’s leadership routinely demonstrates a commitment to adopt new ideas and technologies, to not only exceed compliance, but also provide sustainable solutions that pass the triple bottom line test and will last for many years.



The NBC has consistently embraced the principles of the Utility of the Future. The organization depends on communication amongst employees and encourages a sense of community within the walls of the organization, constantly aiming to involve employees in significant and productive ways. The NBC fosters a positive and collaborative work environment to assure high recruitment and retention of employees and institutional knowledge, which is extremely valuable for the organization. NBC also encourages staff to pursue continuing education by offering a tuition reimbursement program and has implemented a Succession Planning initiative to ensure that younger employees have the tools necessary to replace directors, managers and supervisors that may be approaching retirement. NBC also maintains an awareness and commitment towards workplace safety to ensure employees use safe and environmentally-sound best management practices, while maintaining an employee-friendly and flexible workplace.

Like the positive atmosphere that the NBC promotes within the organization, the NBC fosters a similar ambiance of comradery with the outside community. NBC continuously collaborates with developers, local environmental organizations, educational institutions, government agencies, and other stakeholders to meet our goals and enhance the overall welfare of the communities we serve. The NBC routinely communicates, educates and works together with these groups on projects that will protect and improve our watershed using sustainable and innovative ideas and approaches. In addition, the NBC has established outreach programs that teach members of the community about wastewater treatment facility operations, water quality and our role as an environmental steward. The NBC has an active classroom program, called the NBC Watershed Explorers, teaching elementary school students about water quality and their watershed, has a mentoring program for high school students and hires college students as summer interns. In addition, the NBC has an established web presence through its own website and a strong social media presence on Facebook, Instagram, and Twitter. NBC also administers an award-winning water quality website, "Snapshot of the Upper Bay", (<http://snapshot.narrabay.com/app>) which provides real-time and historical environmental monitoring data, reports, weekly water quality blogs and happenings in the bay for the public to utilize.

The NBC long ago established a Citizens Advisory Committee which meets throughout the year to provide public feedback to the NBC Board, and a CSO Stakeholder group was established to solicit public input into the evaluation of the CSO Abatement Project. NBC also routinely participates with many other stakeholder groups, including a Sustainable Water Quality Solutions stakeholder evaluation project, a Stormwater Utility District evaluation project, the state Executive Climate Change Coordinating Council, and a partnership with the State Department of Environmental Management to monitor bacteria levels in receiving waters to facilitate early openings of shellfish beds for commercial and recreational shell fishing following rain events. The NBC established an Earth Day Grant Program, sponsoring local organizations to conduct annual Earth Day cleanups. In addition, the NBC is working through a stakeholder process, developing proactive relationships, to develop innovative approaches to beneficially and economically reduce nitrogen levels in its receiving waters. The NBC is involved with stormwater management planning, climate resiliency planning and economic development planning.

Lastly, the NBC is a regional leader in energy efficiency, renewable energy generation, and recovery. To help keep costs low for the ratepayers, the NBC is working to become energy self-sufficient and reach a goal of net zero energy use by employing various methods of capturing or purchasing 100% of its energy needs from renewable energy sources. As a first step towards reaching this goal, the NBC installed three wind turbines at our Field's Point wastewater treatment facility, building the first wind farm to operate

in the State of Rhode Island. The NBC has completed the design and is in the process of building a combined heat and power facility at our Bucklin Point facility which will be fueled with biogas captured by the anaerobic digestion of sludge. The NBC is also currently in negotiations to purchase three additional 1.5MW wind turbines and to develop and install two 5-MW arrays of solar panels.

Throughout recent decades, the NBC emerged as a leader in the wastewater industry and in watershed stewardship, however we soon realized that we were much more, we evolved into a more sophisticated entity, a Utility of the Future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

NBC has a well-established financial sustainability program with long-range financial planning, consistently indicating a strong financial performance while ensuring that financial reports and budget presentations remain award-winning and reflect long-term financial stability. The budget process is based on achieving Strategic Plan Goals and Objectives and is performance based.

NBC fosters a positive and engaging work environment to assure high recruitment and retention of employees.

NBC creates a culture for protecting employees by using safe and environmentally sound management practices, while providing a healthy and safe working environment.

NBC promotes an awareness and commitment to employee workplace safety and ensures 100% compliance with all State and Federal health and safety regulations.

NBC established a pay-for-performance evaluation process which establishes lofty goals, maintains periodic tracking of progress toward meeting goals and milestones and provides attention to employee morale including opportunities to celebrate victories for the utility.

NBC has an integrated and well-coordinated senior leadership team which has implemented a tuition reimbursement program, flexible workplace schedules and a succession planning effort to ensure that as senior directors, managers and supervisors retire that younger employees are fully prepared for advancement.

The NBC management team promotes “out-of-the-box” ideas and innovation from employees which is supported by the NBC Board of Commissioners.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Formal Recognition and awards received for various programs throughout the agency	<ul style="list-style-type: none"> <li>• Named one of the <i>Best Places to Work in Rhode Island</i> for excellence in employee engagement (2011, 2013, 2014, 2015, and 2016).</li> <li>• Awarded for Excellence in Management from the National Association of Clean Water Agencies, recognizing innovation and achievements in effective utility management (2008, 2011, and 2014).</li> <li>• One of only sixteen organizations nationwide to win United Healthcare's "Well Deserved" award for exceptional commitment to employee health and well-being (2013).</li> <li>• Awarded the Worksite Wellness Award from Blue Cross/Blue Shield of Rhode Island (2012).</li> <li>• Received a Campaign Award (2008) for outstanding contributions to the community from the State Employees Charitable Appeal of Rhode Island.</li> <li>• Received Alfred P. Sloan Award for business Excellence in Workplace Flexibility (2008).</li> <li>• Received the Asset Management Award from the New England Water Environment Association (2014).</li> </ul>
Financial performance and awards received for financial presentation	<ul style="list-style-type: none"> <li>• Rating of AA- by Standard &amp; Poors, reflecting long-term financial stability and consistent strong financial performance.</li> <li>• NBC ended the fiscal year under budget for the last 18 consecutive years.</li> <li>• Financial Reporting and Budget Presentations have won awards from the Government Finance Officers Association each of the last ten years.</li> </ul>
Number of open positions that internal candidates can qualify for, as part of a Succession Planning program and as a result of employee training and enrichment programs	<ul style="list-style-type: none"> <li>• 37 open positions posted in 2015, filled with 30 internal promotions in 2015</li> </ul>
Training sessions offered per year, number of people and type of workforce development activities conducted (e.g., trainings), hours of training per employee, types of awards received for workplace safety	<ul style="list-style-type: none"> <li>• 45 different training sessions offered each year.</li> <li>• Over 600 employee trainings each year.</li> <li>• 13 of different training sessions offered.</li> <li>• Average of 24 hours of training per NBC employee each year.</li> <li>• Awards: The Narragansett Bay Commission's Environmental Safety and Technical Assistance (ESTA) staff received the George W. Burke, Jr. Award from the New England Water Environment Association for the NBC's excellent Safety Program in 2016 and 2010.</li> <li>• NBC received the A. Joseph Mattera Safety Award from Narragansett Water Pollution Control Association in 2013 and 2007.</li> </ul>
Innovative ideas that are implemented	<ul style="list-style-type: none"> <li>• Staff conceptualized and consultants built Rhode Island's first wind farm to power the Field's Point wastewater treatment facility</li> <li>• Staff developed Pretreatment software that was sold to a private company. NBC staff that worked on the project received a special payment from the sale.</li> <li>• Staff developed a specialized manhole monitoring system which was sold to a private company. NBC staff that worked on the project received a special payment from the sale.</li> </ul>

## COMMUNITY PARTNERING & ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

NBC actively promotes community awareness of the value of clean water and wastewater and stormwater collection and treatment's role in improving the social, economic, public, and environmental health of the community.

NBC routinely conducts outreach with stakeholders and community groups for educational and communication purposes, provides mentoring to high school students and internships to college students.

NBC has developed a comprehensive water quality website to educate stakeholders about water quality issues and a main internet site that details all NBC projects and programs.

NBC awards grants to local organizations to sponsor Earth-Day cleanups and activities to provide assistance to organizations improving the quality of life in their communities.

NBC established a Citizens Advisory Committee that represents all municipalities throughout the NBC service area, industrial and residential sewer users, environmental organizations, and concerned members of the general public to advise the NBC Board and staff on issues and develop a cooperative relationship between the NBC and the people it serves.

NBC created a stakeholder group composed of representatives from government agencies, non-profit associations, member communities, and trade associations to help in evaluating the NBC Phase III CSO Abatement Program.

NBC established a Speakers Bureau of NBC staff that routinely makes presentations locally and nationally.

NBC involves stakeholders in the decisions that will affect them, understands what it takes to operate as a "good neighbor" and positions the utility as a critical asset to the community.

NBC annually publishes the findings of our water quality monitoring initiatives and routinely holds workshops to present findings to stakeholders.

NBC established a stakeholder process to evaluate sustainable, cost-effective solutions to improve water quality in upper Narragansett Bay that could be implemented in lieu of more stringent discharge permit limits. Stakeholders included EPA, DEM, NGO's, municipal officials, academia and more, with a focus on achieving water quality while ensuring the triple bottom line of economic, social and environmental benefits were achieved for the community.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Formal recognition and awards received for various programs throughout the agency	<ul style="list-style-type: none"> <li>• NBC's World Toilet Day exhibit received a National Achievement Award from the National Association of Clean Water Agencies for Excellence in Public Education (2012).</li> <li>• NBC's DVD <i>Environmentalism at Work</i> received a National Achievement Award from the National Association of Clean Water Agencies for Excellence in Public Education (2011).</li> <li>• Received a National Public Education Award from the National Association of Clean Water Agencies for their classroom outreach program, Woon Watershed Explorers (2007).</li> <li>• Received National Public Education Award from the National Association of Clean Water Agencies for DVD <i>The Biggest Project You'll Never See</i>, about the Combined Sewer Overflow Abatement Project (2006).</li> <li>• Narragansett Bay Commission's Snapshot of Narragansett Bay web module received a National Environmental Achievement Award from the National Association of Clean Water Agencies for Excellence in e-media.</li> <li>• Accepted the Water Quality Improvement Award from the Water Environment Federation in 2014.</li> <li>• Received the Water &amp; Wastes Digest 2015 Best Project Award, recognizing NBC's innovative IFAS system, the largest IFAS system in the world.</li> </ul>

Success of NBC's Watershed Explorers Classroom Outreach Program, number of students participating, number of schools participating each year	<ul style="list-style-type: none"> <li>NBC has an active classroom program called Watershed Explorers, working with elementary school students in a year-long exploration of water quality science and offers frequent facility tours to school groups and the public.</li> <li>Over 5000 students participating in this program over the past ten years.</li> <li>9-11 schools participate annually.</li> </ul>
Number of visits to the Snapshot website containing environmental monitoring data	<ul style="list-style-type: none"> <li>2,990,639 page visits since the initial posting in 2008</li> <li>1,004 average page views per day</li> <li>931,112 total website visitors</li> </ul>
Number of ongoing communications network actions/activities engaging social media	<ul style="list-style-type: none"> <li>Twitter Followers: 718</li> <li>Instagram Followers: 81</li> <li>Facebook Likes: 274</li> </ul>
Increased shellfishing due to collaborative partnerships with state agencies, number of extra open shellfishing days due to NBC monitoring efforts	<ul style="list-style-type: none"> <li>The NBC monitors bacteria in Narragansett Bay following large rain events to support the State Department of Environmental Management decision-making to close and re-open shellfishing areas following rainstorms. The results of this monitoring allowed the State to relax shellfish bed closure restrictions, allowing a significant increase in shellfishing days during the year (45 – 65 extra days annually).</li> <li>24 extra shellfishing days in 2015 due to special monitoring.</li> </ul>
Stakeholder involvement in decisions that affect them, number of stakeholder groups NBC is involved in, number of stakeholders attending free NBC informational workshops	<ul style="list-style-type: none"> <li>40 people participated in the Phase III Stakeholder Program in 2015</li> <li>Various members of the NBC staff are involved in numerous stakeholder groups that focus on social, environmental and economic issues in the NBC service district and watershed.</li> <li>95 stakeholders attended a free full day water quality informational workshop hosted by the NBC in 2015 to promote sharing of knowledge and communication of data.</li> </ul>
Types of collaborations on data collection and assessment	<ul style="list-style-type: none"> <li>Partner and Vice-Chair of the Rhode Island Environmental Monitoring Collaborative.</li> <li>Senior Advisor to the Rhode Island Sea Grant Program.</li> <li>Narragansett Bay Estuary Program – Status and Trends Report.</li> <li>Co-sampling with University of Massachusetts to aid in calibration of model and comparison of Blackstone River nutrients samples.</li> <li>EPA co-sampling of total suspended solids in Narragansett Bay to align methods and compare data (2016).</li> <li>Support/Collaboration with University of Rhode Island to collect samples and data to develop a hydrodynamic model of nutrient cycling in Narragansett Bay (2004-ongoing).</li> <li>Partner in the RI Fixed-Site Monitoring Network which conducts water quality monitoring throughout Narragansett Bay, providing on-line access to real-time data.</li> <li>Support the Rhode Island Shellfisherman's Association by assisting with shellfish transplants from closed areas.</li> </ul>
Establishment and participation in River Restoration Grants/NBC Earth Day River Cleanup Grants	<ul style="list-style-type: none"> <li>NBC sponsored full day river clean ups from 2002 through 2012, beautifying areas of the NBC service district.</li> <li>From 2013-2016, over 70 organizations have been supported with grants from NBC, assisting over 14,000 volunteers to participate in Earth Day Clean-ups to help make a difference for clean water in their communities.</li> </ul>

Sustainable Water Quality Solutions for Upper Narragansett Bay Stakeholder Group	<ul style="list-style-type: none"> <li>• NBC was instrumental in creating a grant funded workgroup to evaluate alternative sustainable strategies, such as building oyster reefs, for improving water quality in Narragansett Bay ensuring that the triple bottom line is achieved. This group allowed experts from universities, state agencies, and research institutions to gather for several meetings throughout 2015 to explore ideas for cost-effective ecosystem based water quality improvements.</li> <li>• The stakeholder group convened for 7 meetings throughout the year and provided input on alternatives throughout the re-evaluation.</li> </ul>
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## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

NBC’s Energy Team assists all departments to investigate and implement cost saving hazardous material source reduction, renewable energy, energy conservation, and efficiency opportunities. Remain consistent with NBC’s overall Strategic Plan and continue to develop energy efficiency master plans, develop and implement new energy efficiency projects and communicate strategies to NBC staff.

NBC’s Energy Team conducts and participates in energy research activities, works on projects, publishes fact sheets and technical papers on findings from energy studies and projects.

NBC developed and implemented a Stormwater Mitigation Program in 2003, which encourages the use of LID green infrastructure, removing stormwater from the sewage system and further reducing energy requirements.

NBC has evaluated and replaced pumps, blowers, lighting, etc. throughout the NBC facilities with more energy efficient equipment.

NBC Participates in the EPA Energy Star Portfolio Manager program.

NBC has partnered with URI to measure greenhouse gas emissions from treatment tanks with the goal of optimizing tank processes to reduce emissions and save energy.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Amount of energy reductions relating from energy efficiency improvements	<ul style="list-style-type: none"> <li>The NBC saves 3,200,000 kWhs/year with existing energy efficiency improvements.</li> </ul>
Number of identified future energy efficient improvements to be made	<ul style="list-style-type: none"> <li>The NBC estimates to save an additional 2,918,635 kWhs/year with future energy efficient improvements.</li> </ul>
Tons of greenhouse gases reduced annually by implementing energy efficiency initiatives	<ul style="list-style-type: none"> <li>NBC reduces its CO2 emissions by 1,057 metric tons each year with its completed energy efficiency projects.</li> <li>NBC will annually reduce its CO2 emissions by an additional 964 metric tons once the planned/designed energy efficiency projects are completed.</li> </ul>
Establishment of an Energy Efficiency Master Plan	<ul style="list-style-type: none"> <li>NBC's Energy team continuously evaluated energy usage and implements efficiency opportunities annually.</li> <li>The NBC plans to obtain 100% of its energy needs from renewable sources by 2020.</li> </ul>
Research Activities	<ul style="list-style-type: none"> <li>Annual reports and technical reports are published and posted online to NBC's award winning website.</li> <li>NBC staff regularly writes and maintains fact sheets and BMPs for users.</li> <li>Staff routinely gives presentations at regional and national conferences each year.</li> </ul>
Energy efficiency assessments conducted of sister utilities	<ul style="list-style-type: none"> <li>NBC conducted energy efficiency assessments of other wastewater and water facilities in the State of Rhode Island.</li> <li>NBC provided written Energy Efficiency reports to 7 water treatment and 15 wastewater treatment facilities.</li> </ul>

**ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

NBC established a goal to achieve net-zero energy by implementing renewable energy projects to provide all energy by 2020.

Establishment of co-generation systems to produce renewable energy to lessen the burden on the local grid and reduce greenhouse gas emissions.

Enjoy community benefits from installed green infrastructure.



Ensure that federal and state financial incentives are secured for renewable energy projects.

NBC has been working with the University of Rhode Island to measure greenhouse gas emissions from all process wastewater tanks, with the goal of optimizing tank operation to minimize emissions.

The NBC Energy Team performed energy audits of all wastewater treatment plants in the state, providing every plant with a report detailing energy conservation and renewable energy opportunities.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Reduced non-renewable energy use and carbon footprint	<ul style="list-style-type: none"> <li>• In 2012, NBC installed three 1.5 MW wind turbines at the Field’s Point WWTF, creating the State of Rhode Island’s first windfarm. The wind turbines generate clean renewable energy for on-site use within the WWTF and help offset utility supplied electricity.</li> <li>• The NBC uses renewable electricity from three 1.5 MW wind turbines, natural gas from the local pipeline, and renewable biogas from the anaerobic digestion of bio-solids.</li> </ul>
Percent of energy that is renewable; cost savings	<ul style="list-style-type: none"> <li>• The availability of various incentives in place within the State of Rhode Island to encourage the use of alternative energy resources, the NBC has established a goal of obtaining 100% of its electrical energy needs from local renewable energy resources by 2020.</li> <li>• Wind turbines have generated more than 23,960,000 kWhs of electricity supplying the NBC’s FP WWTF with 45% of its electricity, which has eliminated 8,700 metric tons of greenhouse gas emissions.</li> <li>• The Bucklin Point 600 kW CHP System will be operational in 2017 and will generate about 5,000,000 kWh/year of renewable electricity or about 35% of BP WWTF’s electrical demand.</li> <li>• In order to fully achieve the goal of obtaining 100% of all electrical energy from local renewable sources, the NBC is utilizing newly enacted State of Rhode Island “virtual net metering” laws. The NBC is developing two off-site 5 MW solar systems capable of supplying more than 18,200,000 kWh of renewable electricity and three off-site 1.5 MW wind turbine energy systems capable of supplying 9,296,000 kWh/year of renewable wind energy.</li> </ul>
Energy Recovery	<ul style="list-style-type: none"> <li>• In 2015, 85% of the digester heat demand was obtained from renewable biogas.</li> </ul>
Tons of greenhouse gas emissions reduced by NBC alternative energy projects	<ul style="list-style-type: none"> <li>• The NBC reduces about 2,850 tons of CO2 equivalents annually by utilizing wind turbines to generate electricity.</li> </ul>
Alternative energy assessments conducted of sister utilities	<ul style="list-style-type: none"> <li>• NBC conducted alternative energy assessments of other wastewater and water facilities in the State of Rhode Island.</li> <li>• NBC provided written alternative energy reports to 7 water treatment and 15 wastewater treatment facilities.</li> </ul>

## WATERSHED STEWARDSHIP

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

The NBC held an extensive stakeholder process for comment on evaluation of alternatives in triple bottom line analysis for the Phase III CSO Abatement project. With seven Stakeholder meetings held between March and December 2014, the diverse group was able to assess the water quality and financial impacts and benefits of the Phase III project. Due to financial implications, the original project was changed.

The NBC has a holistic, integrated protection approach to manage significant potential sources of contaminants in the watershed that improves surface water quality.

The NBC has an integrated program to address wet weather issues, including such sources as regulated stormwater, unregulated runoff, CSOs, SSOs, peak flow, and source water protections.

The NBC has systems that add value to the urban landscape with resilient, adaptable, affordable and environmentally sensitive water infrastructure that continues to provide basic services but also enhanced recreational, aesthetic, and environmental value.

The NBC sponsors an annual Earth Day Clean-up Program, awarding approximately \$10,000 annually to about 20 local river and watershed groups to help them cleanup rivers, lakes and streams.

The NBC has an extensive water quality monitoring program to monitor river and estuarine receiving waters and to educate stakeholders and regulatory agencies about water quality improvements.

The NBC has a well-established, award-winning Stormwater Mitigation Program to reduce the impact of stormwater on the NBC sewer system. The sewer connection permit process requires property owners to investigate stormwater mitigation measures, along with Best Management Practices (BMP), to manage stormwater runoff on site. These measures must be detailed to NBC in a Stormwater Mitigation Plan, which must be implemented by the developer.

The NBC has created a wetlands treatment system within the City of Central Falls to treat CSO overflows. Solids are collected and removed and wetlands provide additional treatment and habitat. The new Operations building incorporates green infrastructure with a rooftop garden, and LID

infrastructure surrounding the building, including porous pavement, drywells, infiltration galley, and downspouts.

The NBC was instrumental in creating a grant funded workgroup to evaluate alternative sustainable strategies for improving water quality in Narragansett Bay. Following completion of the NBC Phase II CSO project, the NBC offered to provide land acquired for the construction site to a local river watershed group so they could implement green infrastructure and open space.

The NBC has been participating with RIDEM and local cities and towns to evaluate the formation of a Stormwater Utility District (SUD).

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Reduction in wet weather impacts as a direct result of sewer connection permit process and Stormwater Mitigation Program	<ul style="list-style-type: none"> <li>Since 2003 there has been a reduction of over 7.5 million gallons of stormwater into the NBC collections system as a result of the forward thinking sewer connection permit process and the stormwater mitigation plan through the NBC Permits and Planning department.</li> </ul>
Construction of wetland facility for Combined Sewer Overflow mitigation and treatment	<ul style="list-style-type: none"> <li>Underground storage tanks and diversion of stormwater flow through a constructed wetland, with a footprint of less than 1 acre is able to treat a total of 1.05 MG instead of directly discharging through a CSO.</li> </ul>
Implementation of Green infrastructure	<ul style="list-style-type: none"> <li>The NBC has two green roofs, and rain gardens installed on the Operations Building and the new Lab Building has a rain garden.</li> </ul>
Green infrastructure	<ul style="list-style-type: none"> <li>The construction of green roofs and raingardens throughout the NBC properties has created an aesthetically appealing aspect to the grounds landscaping. Two green roofs, and a rain garden are installed on Operations Building, and the new Lab Building has a rain garden. These projects demonstrate to the public NBC's commitment to protect our watershed.</li> </ul>

## NEW Water, Green Bay WI



### NEW Water, Green Bay WI

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Community Partnering & Engagement



Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Regional System, Multiple Plants		
Service Area (square miles): 285	Average annual daily flow (MGD): 39	
Population Served: 231,000		
Location		
Street Address: 2231 North Quincy Street		
City: Green Bay	State: WI	Zip Code: 54302
Contact Information		
Name: Thomas W. Sigmund	Phone: 920-438-1095	Email: tsigmund@newwater.us

**NARRATIVE:** NEW Water, the brand of the Green Bay Metropolitan Sewerage District (GBMSD) has changed its approach to delivering clean water over the last few years to reflect the initiatives identified in the Utility of the Future concepts. NEW Water incorporated those concepts into its recently released Strategic Plan, and they now drive much of the Utility's day to day operations.

NEW Water's leadership has participated in several initiatives sponsored by EPA, WEF, and NACWA that include: Effective Utility Management (EUM), Water Resources Utility of the Future (UOTF), and as a road tester for EPA's Sustainability Roadmap. NEW Water's Executive Team and Management Team involvement in reviewing and implementing the output from these initiatives has given staff a deeper understanding of the concepts and how to incorporate them into their daily business.

In anticipation of the changes needed to transform the utility to better meet future needs, GBMSD 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 has 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.

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 2016. Using that as a base, staff have ventured into other areas such as risk based 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.

NEW Water created an employee leadership development program, in conjunction with a local technical college, to deliver formal and informal leadership skills to its employees at three levels of leadership. The program presents material from an instructor and encourages peer to peer learning to identify real examples to validate the training.

In efforts to propel the organization forward with a strategic focus, NEW Water's staff have developed annual personal goals that support organizational, division, and department goals. Ongoing training is provided to help employees stay on track.

Faced with a need to address an aging solids handling system, NEW Water took a new approach. Instead of just replacing the technology in kind, NEW Water's staff and consultant envisioned a system that would cost-effectively maximize resource recovery and ensure system reliability. The resulting project, called Resource Recovery and Electrical Energy or R2E2, met customer service and permit requirements to process solids, but also incorporated recovery of electrical and heat energy to offset 50% of purchased energy, added capacity to accept high strength waste to generate even more electricity, and added a struvite recovery system to capture phosphorus and provide an annual \$400,000 revenue stream.

The R2E2 project was the first initiative by NEW Water into resource recovery and has spurred staff to look at opportunities to reduce resource consumption at the facilities, as well as identify the next opportunities to recover resources from the material NEW Water receives from its customers. These opportunities are built into goals for individual employees as well as teams of employees.

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.

NEW Water worked with its Commission, staff, and customers in 2015 to develop an updated strategic plan that was adopted in early 2016. The plan supports a new vision for the utility, "Protecting our most valuable resource, water", and developed a strategic investment portfolio for the next five years focused on: Operational Resiliency and Optimization, Regional Water Quality Improvements, and Resource Recovery. The plan has specific implementation actions, schedules and measures for each action.

#### COMMUNITY PARTNERING AND ENGAGEMENT

NEW Water realized it needed to better engage its customers and other stakeholders and raise the profile of water related issues as it embarked on significant capital improvement projects, working out in the watershed, resource recovery, and system optimization. NEW Water was also aware that partnering with organizations that the stakeholders knew and trusted would be the quickest and most effective way to successfully reach those groups.

Through effective outreach efforts, NEW Water has become a trusted source of water environment information for local and regional, print, social, and television media, and NEW Water's opinion is sought out when the groups are developing stories on environmental issues. NEW Water provides information of interest to residential customers by providing the municipalities with finished products in a manner that can be easily disseminated.

In addition to tours of our facilities for schools, the public, and elected officials, NEW Water goes out to organizations and delivers its message as well as working with watershed stakeholders interested in improving storm water quality on urban and rural lands. NEW Water has seen a significant improvement in relationships with its customers, as well as partnership opportunities with previously non-traditional stakeholders.

#### WATERSHED STEWARDSHIP

NEW Water identified several years ago that spending over \$220 million to upgrade its two treatment facilities to remove incremental amounts of phosphorus from its effluent was an inefficient use of limited customer resources. NEW Water helped develop enabling legislation to allow direct dischargers use of an alternative compliance method called Adaptive Management where point sources work with nonpoint sources (urban or rural storm water) to achieve equal or greater reduction of phosphorus in the watershed, presumably at a lower cost than improvements at the treatment facilities.

NEW Water has been working for the last two years on a pilot scale (4,800 acre) Adaptive Management project to see if it can administer this complex process with several hundred stakeholders and cost-effectively affect positive water quality and habitat improvements through improvements in land use and cropping practices. This work is being done at a pilot scale because by late 2018 NEW Water must decide if it wants to continue this initiative at a larger watershed scale for the next 20 years, or if it wants to construct phosphorus removal facilities at its treatment facilities.

Preliminary results show that Adaptive Management has greatly increased the number of stakeholders engaged in watershed activities and has 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.

Perched at the edge of the Fox River, NEW Water's Jack Day Environmental Education Center serves as headquarters for this community collaboration to improve area waters. With a dearth of public access points to the water in the Green Bay area, this center provides an inspirational setting for these efforts. On the wall, we have placed a quote from former NEW Water Commissioner and Professor Emeritus Jack Day, which serves to motivate the team on its journey to protect this gateway to the Great Lakes: "Never forget that you live at the mouth of the largest freshwater estuary in the world...and never forget the great responsibility you bear for that."

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Integrated and well-coordinated senior leadership team – NEW Water's Executive Team meets on a weekly basis to discuss in a timely manner issues that are important for the organization. NEW Water's larger Management Team meets on a monthly basis to share information across departments.

Provides opportunities to consult with employees in new processes, innovations – Employees were consulted and were the first to see the roll-out of the NEW Water branding initiative. Staff serve on cross-functional working teams to interview and select new employees, review project studies and designs, and a sustainability team to identify and develop energy saving projects focusing on the triple bottom line.

Drives an awareness and commitment to workplace safety – Every employee has a safety goal, improving safety is one of NEW Water's four-organization wide goals, and NEW Water's cross-functional Safety Committee meets on a monthly basis to discuss safety issues, identify and fund safety improvement projects, and members of the team pair up to conduct facility safety audits.

Financial sustainability – NEW Water has a risk-based asset management process where condition and criticality assessments are conducted and documented and improvement projects are identified. A

capital improvement project (CIP) business case form is developed for every project over \$35,000 and the business case is reviewed and scored by the Executive Team which serves as the CIP review team to prioritize projects for inclusion in the capital improvement plan..

#### *Performance Measures & Results*

- Improve workplace safety: Recordable incident rate below 50% of the industry average
- Improve workplace safety: Increase near miss accident reporting by 25% each year
- Leadership development: Train 36 individuals each year in leadership skills through in-house leadership development program
- Improve workplace safety: Every employee has a safety goal, every year
- Increase non-rate revenue: Designed electricity generation and heat recovery system to avoid purchase of \$2,000,000 per year of offsite energy
- Increase non-rate revenue: Contracted with technology provider for up to \$400,000 per year revenue from struvite harvesting.

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Partnership with Northeast Wisconsin Technical College (NWTC) to launch Environmental Engineering Program. NEW Water's Treatment Department worked with NWTC to develop an Environmental Engineering program, which has resulted in quality hires for NEW Water.

Partnership with Green Bay Area Public Schools, the Chamber of Commerce, University of Wisconsin-Green Bay, and NWTC, to launch a Youth Apprenticeship Program – the first of its kind in the state of Wisconsin. As a result of this collaboration, NEW Water was lauded with the "Friends of Education" Award from Wisconsin Secretary of Education Tony Evers.

Media engagement for Public Service Announcements. NEW Water takes a proactive approach to engage area media for help in disseminating important public service announcements, including "What not to flush," World Toilet Day, and FOG (fats, oils, and grease).

Established a "NEW Watershed Champion" Award in partnership with the Green Bay Water Utility for World Water Day. This annual celebration highlights positive work being done in our watershed to improve water quality, and culminates in an award. School children are coordinated to perform at the event, which has received widespread media coverage and accolades from community leaders.



Partnership with the Brown County Public Library. Through this partnership, NEW Water has held, what the library manager tells us, is the most popular exhibit they remember having – a World Toilet Day exhibit. A toilet on wheels, features an informational board about global sanitation issues, and the importance of caring for our local sanitation system, with an informative “what not to flush” graphic. The see-through tank reveals a scuba-diving cow that pops up when the device is flushed, making it a draw for families and entertaining to boot, helping convey the messaging in a fun context, which will increase the likelihood of its effectiveness.

NEW Water is a member of the Brown County Lean initiative. Through this collaboration, NEW Water has learned best practices from area members. NEW Water has implemented 30 completed Lean Projects since membership began, with a savings of some \$100,000 to the organization.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Position the R2E2 Project as an environmentally safe, fiscally responsible solution to NEW Water’s need for a new solids handling facility.	<p>Convened a stakeholder advisory group to assess various options for NEW Water’s need for a new solids handling facility.</p> <p>Successfully courted media to help publicize the environmental, financial aspects, as well as the progress of the project.</p> <p>Conducted a successful public launch of construction event in 2015, which included positive remarks from the Mayor of Green Bay, the Brown County Executive, Congressman <del>Ribble</del>, and participation by the Green Bay Area Chamber of Commerce. The event received blanket media coverage for the region – covered by all area TV and print media.</p> <p>R2E2 project updates have continuously been promoted via the NEW Water website, newsletters, social media, employee briefings, talks throughout the community, and tours. Held two public open houses in 2015.</p>
Increase public visibility of NEW Water through talks, tours, and events.	NEW Water’s talks, tours, and other outreach activities in 2015 reached more than 21,700, compared with 12,000 in 2014. Tour groups included Outward Bound, NWTC, and a delegation from Peru. Talks and presentations included the University of Wisconsin–Green Bay’s Learning in Retirement, Optimists Club of De Pere, and Leadership Green Bay through the Green Bay Area Chamber of Commerce.
Position NEW Water as a community	Media coverage including local, regional, and national coverage,

<p>partner and leader on water quality issues through earned media.</p>	<p>and stories including “What not to flush,” “R2E2 Construction Launch,” and “Microbeads Legislation,” with 61 media impressions in 2015.</p>
<p>Harness the NEW Water website as an effective vehicle to disseminate NEW Water messaging.</p>	<p>NEW Water organized an internal, cross-divisional team to overhaul the website, making it more user friendly, with relevant content, and to switch over to a “responsive” format that recognizes the type of device accessing the site, and resizes accordingly. NEW Water’s website traffic increased 34% in 2015 over 2014.</p> <p>Also noteworthy is that 22% of those web visitors accessed NEW Water’s site from a mobile or tablet device, compared with 17% of those who did so in 2014; therefore, reinforcing the merit in the “responsive” approach.</p>
<p>Effective outreach with area officials.</p>	<p>On the heels of queries from one municipal customer at a Commission meeting, NEW Water orchestrated a tour for the entire board of elected officials from that municipality. NEW Water staff tailored a tour to fit their needs and received positive feedback. They expressed their appreciation to our Commission, having gained a greater understanding of NEW Water.</p> <p>Collaborated with Congressman Reid Ribble, and arranged a Bay of Green Bay tour for him on NEW Water’s monitoring workboat, the Bay Guardian. The visit earned TV coverage, and also was promoted by Congressman Ribble on social media. Congressman Ribble has helmed the “Save the Bay” initiative, and publicly expressed gratitude for NEW Water’s efforts in helping to educate him on water issues facing the community.</p>
<p>Foster better relations with NEW Water’s neighbors in east Green Bay.</p>	<p>NEW Water proactively convened a neighborhood meeting of east Green Bay neighbors to update them on the impending R2E2 construction, odor mitigation efforts, and water quality improvement efforts.</p> <p>Qualitative results: Neighbors expressed great appreciation for NEW Water’s proactive outreach efforts, the quality of information provided, and expressed an interest in continued update meetings. NEW Water has since received zero complaints from neighbors regarding odor or construction.</p>
<p>Conduct targeted media outreach with targeted messaging to promote NEW Water’s foray into Adaptive Management and the Silver Creek Pilot Project.</p>	<p>Earned front-page media coverage in local media, and significant coverage in regional media. Following media coverage, received a \$300,000 grant. Another grant from the EPA followed.</p>
<p>Position NEW Water as a partner and leader in career development for area youth.</p>	<p>NEW Water staff worked with NWTC to create the first Environmental Engineering program, and continues to serve on the Board. NEW Water has hired several employees who have graduated from this program.</p>
<p>Convene key stakeholders for Silver Creek Project to facilitate a quality end result.</p>	<p>Identified and invited key stakeholders to join the Silver Creek Project Steering Committee, and received 100% commitment and participation from all stakeholders. Partners include: University of Wisconsin–Green Bay, The Nature Conservancy, Ducks Unlimited, Outagamie County, Brown County, and the Oneida Tribe of Indians.</p>
<p>Produce and disseminate quality, relevant information for/to NEW Water stakeholders.</p>	<p>Have received positive response from community members on quality of materials, including reposting, and repurposing of NEW Water material.</p>

	<p>In 2015, NEW Water provided 600+ website updates, 8 newsletters, and 100+ social media /video/graphic postings.</p> <p>Fact sheets, Frequently Asked Questions (FAQs), and videos are also regularly produced on various topics to help educate the community.</p>
<p>Serve as an open and responsive partner to NEW Water ratepayers.</p>	<p>NEW Water organizes and produces four “update” meetings and one “customer appreciation luncheon per year with relevant topics of interest to its customers, including R2E2, interceptor master plan, “what not to flush,” and the annual budget.</p> <p>NEW Water arranged a “How is my bill calculated?” tour for municipal customers, which included a bus trip to metering stations, lift stations, the NEW Water lab and treatment facility to explain the process, and to introduce the people “behind the scenes.”</p> <p>Qualitative results include customers expressing to the NEW Water staff and Commission, the appreciation for NEW Water’s open, responsive communications. Customers have said they appreciate having scheduled blocks for these meetings during which they can come to NEW Water and have guaranteed time with key staff after the meetings as well.</p>
<p>Participate in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets.</p>	<p>NEW Water helmed the “Dale Preston Memorial Bench” project at the Jack Day Environmental Educational Center. With few public access points to the water in the greater Green Bay area, NEW Water leverages its Jack Day Environmental Education Center, which sits on the Fox River, to gain community steam in water quality issues.</p> <p>In 2015, through collaboration between numerous community partners: Brown County Port &amp; Resource Recovery; KI; NWTC; City of Green Bay; Habitat for Humanity-Green Bay; NEW Plastics; and project sponsor, Mrs. Nancy Preston. The Bench is the first of its kind in the city, and the first bench in the park outside the Jack Day Center.</p>
<p>Join forces with water entities to help spread the value of water message: Creation of World Water Day.</p>	<p>NEW Water partnered with the Green Bay Water Utility to commemorate “World Water Day” in March. The two partners leveraged the event to call attention to local water issues, and to present a “NEW Watershed Champion” Award to highlight positive efforts occurring in the community to improve water. School children are coordinated to perform at the event, which has received widespread media coverage and accolades from community leaders.</p> <p>NACWA recognition: Received the Public Information and Education Award for World Water Day.</p>
<p>Enhance Adaptive Management and Silver Creek Pilot Project through an educational outreach component.</p>	<p>Launched “Silver Creek CREW” student monitoring program in 2015. 80 students, four stations, four hours of water science curriculum, hands on activities, 80 pairs of muddy boots, 80 exhausted, happy teens who spent a day outdoors learning about the importance of water to our community. Received positive media coverage and social media impressions from community partners.</p>

<p>Amplify NEW Water’s outreach efforts through development of a Speakers Bureau.</p>	<p>In 2015, launched a Speakers Bureau of current staff and retirees. Talks, tours, and activities are enhanced by the Bureau’s involvement, and staff also report increased employee morale from being engaged with community outreach. Recruited 20+ members, and growing. Orchestrated four training sessions with Bureau members, “Public Relations 101,” and organized more than 20 events for Bureau participation.</p>
<p>Provide relevant Public Service Announcements of value to the community. Launched a “Love Your Pipes” campaign.</p>	<p>After discovering “rags” plaguing lift stations and receiving reports of residential basement backups, NEW Water began a “Love Your Pipes” campaign, which includes a dedicated website with relevant information on FOG, proper disposal of medications, and “what not to flush.”</p> <p>To spread a little holiday cheer, NEW Water corralled the Speakers Bureau and other staff to volunteer to sing in a video, “O Love Your Pipes,” to the tune of “O Christmas Tree.” The video earned 1,241 views, was re-posted on various social media outlets, and publicized in news outlets from North Carolina to California.</p> <p>NEW Water also partnered with WBAY TV to produce a “Don’t Turkey Your Drain” TV spot at Thanksgiving, which implored people to not pour grease down the drain. The piece was aired on the evening news and publicized on social media.</p>
<p>Collaborate with area environmental stakeholders to enhance environmental activities, awareness, and appreciation.</p>	<p>Ongoing partnership with the Fox Wolf Watershed Alliance on various water quality improvement efforts, including NEW Water staff serving on the Board of Directors. In 2015, NEW Water teamed up with the Fox Wolf Watershed Alliance for the Jack Day Environmental Education Center, located on the Fox River, to serve as a headquarters for an Earth Day River Clean-Up event.</p>
<p>Participate in community activities to improve public access to water.</p>	<p>Collaboration with Green Bay Chamber of Commerce’s Leadership Green Bay project: “Bring Back the Beach.” This public awareness campaign aimed to call attention to the dearth of public access points to waterways in the Green Bay area, and the fact that the beach has been closed for more than 50 years. The Campaign culminated in a Family Fun day at Bay Beach Amusement Park, which featured booths and activities for families and children, including creation of a temporary giant sandbox. NEW Water helped with messaging, event coordination, and hosted a booth with a hands-on fun water science activity for children, and clean water messaging for their guardians. The event gained excellent media coverage. The Mayor of Green Bay cited the initiative as his reason to seek funding for an engineering study for establishing a beach at the city’s iconic Bay Beach. The beach was once the draw of people from around the Midwest, who came to stroll along the beach, swim, and to attend concerts. Other community partners included the Children’s Museum of Green Bay, Green Bay Parks Department, and the Neville Public Museum.</p>

## **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Evaluation of water quality trading options – In addition to the Adaptive Management activities, NEW Water has evaluated water quality trading in its watershed as a compliance option.

### *Performance Measures & Results*

NEW Water Performance Measure(s)	NEW Water Results (quantitative or qualitative)
<p>Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.</p>	<p>Green Bay Metropolitan Sewerage District rebranded its name in 2012 to <b>NEW Water</b> (North East Wisconsin – Water; or taking in wastewater and creating a new product, water) to better represent and describe the 285 square miles, 230,000 residents in 18 municipalities regionally that NEW Water provides services.</p> <p>In 2015 conducted strategic planning with NEW Water Commission and created new vision statement: <b><i>Protecting Our Most Valuable Resources, Water.</i></b></p>
<p>Integrated approach to manage and evaluate the cost effectiveness and water quality impacts of nonpoint pollution pilot project.</p> <p>Feasibility study to assess policies that fully account for the benefits and costs of green infrastructure.</p>	<p>Developed a project vision, team charter, and detailed goals for phosphorus and sediment reduction in the Silver Creek watershed pilot project. Local partners and stakeholders included: The Oneida Tribe of Indians, Brown County, Outagamie County, University of Wisconsin–Green Bay, US Geological Survey, US Fish and Wildlife Service, USDA Natural Resources Conservation Service, Ducks Unlimited, The Nature Conservancy, Fox Wolf Watershed Alliance, Wisconsin Department of Natural Resources, Wisconsin Department of Agriculture Trade and Consumer Protection, and the Alliance for the Great Lakes.</p> <p>Established water quality monitoring program, soil phosphorus testing, watershed modeling, conservation practice planning, and began implementation of conservation practices in 2015 in Silver Creek Pilot Project.</p>
<p>Increased hydrological stability in sub-watershed within Lower Fox River Basin.</p>	<p>Provided funding for buffer strip and natural area installation at \$54,000 per year for four years on Oneida Tribal Land permanently protecting 62 acres.</p> <p>Obtained \$2,010,000 in grants for best management installation including \$240,000 for wetland restoration implementation, which will be installed from 2016 – 2020.</p>
<p>Maintenance policies that enable green infrastructure maintenance.</p>	<p>Developed cost share agreements that will require sustainable permanent conservation practices by attaching the cost share agreement with maintenance requirements to landowner’s deed.</p>
<p>Workforce capable of evaluating and maintaining effective green infrastructure.</p>	<p>Created an Environmental Programs Division at NEW Water that included a Director, Watershed Manager, and Water Resources Specialist focused on working on watershed solutions to improve water quality by nonpoint source reductions of phosphorus and TSS.</p> <p>Developed agreements with Outagamie County Land and Water Conservation Department (\$60,000/yr), Brown County Land and</p>

	Water Conservation Department (\$25,000/yr), and staffing contributions from Oneida Tribe of Indians (\$32,000/yr) to implement nonpoint conservation practices to reduce phosphorus and sediment loading to Green Bay.
Evaluation of water quality trading options.	Worked with Great Lakes Commission on development of a hypothetical trade exercise (2014) and in process of formalizing an actual water quality trade between an agriculture producer and NEW Water to help demonstrate the trading process as a template for other wastewater treatment facilities.
Evaluation of water quality of Fox River and Green Bay.	NEW Water established an Aquatic Water Quality Monitoring Program for water quality sampling of Green Bay in 1986. The Bay Guardian boat was purchased and through sampling has collected thousands of water quality samples from the mouth of Green Bay to Sturgeon Bay. Data collected and analyzed by NEW Water in collaboration with the University of Wisconsin has discovered and is monitoring a dead zone in Green Bay.

## New York City -- Department of Environmental Protection NY



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### New York City – Department of Environmental Protection NY

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Type: Water and wastewater utility (60% combined system; 40% separate)		
Service Area (square miles): 305	Average annual daily flow (MGD): 1300 MGD	
Population Served: 9 million		
Location		
Street Address: 59-17 Junction Blvd		
City: Flushing	State: NY	Zip Code: 11373
Contact Information		
Name: Kim Cipriano	Phone: (718) 595-4134	Email: kseiler@dep.nyc.gov



**NARRATIVE:** The New York City Department of Environmental Protection (DEP) protects public health and the environment by supplying clean drinking water, collecting and treating wastewater, and reducing air, noise, and hazardous materials pollution. As the combined water supply and wastewater utility for the nation’s most populous municipality, we distribute more than one billion gallons of clean drinking water and treat 1.3 billion gallons of wastewater each day. DEP has made a concerted effort to embed innovative thinking and continual improvement into our agency structure, internal processes, and approach to stakeholder outreach, allowing us to successfully adapt to the environmental, social and climatic challenges of today as well as those on the horizon. As detailed in the topical segments below, DEP exemplifies the triple-bottom-line principles of a “Utility of the Future” through a proactive, holistic approach to organizational culture, community partnering and engagement, energy efficiency, energy generation and recovery, and watershed stewardship.

### Organizational Culture

At DEP, we recognize that innovative performance and policies start from within. Our senior staff meets biweekly to discuss ongoing initiatives and stimulate challenging conversations that guide DEP’s pioneering efforts on technology, safety, sustainability, and social equity.

To support our goal of fostering organizational excellence, DEP offers a wide range of technical and managerial training for our employees. In 2014, DEP launched a two-pronged leadership and management program that has engaged 725 employees to date. “Managing for Excellence” is a four-day intensive training for managers that underscores fundamental management strategies to motivate, inspire, create accountability, and improve morale. “Supervision in Action” is an introductory course that teaches new supervisors the skills necessary for their professional transitions. Overall, DEP employees logged 78,000 hours of formal training in technical and certification courses in areas such as Quantitative Analysis, Conflict Resolution, and Project Management in 2015.

This year, DEP will complete a five year initiative designed to improve service delivery and enhance productivity by implementing industry best practices and leveraging staff expertise. The project has saved the city \$84 million each year in cost-oriented improvements and enhanced revenue collection initiatives. In 2013, DEP launched a complementary program to reinforce the principles of continuous improvement by providing employees with an opportunity to submit and be recognized for creative ideas that improve efficiency and safety at DEP. DEP provided information through its internal website and posted signage at approximately 100 facilities notifying employees about paper-based and digital submission methods.

### Community Partnering and Engagement

- DEP’s critical services are used by every New Yorker, every single day. Actively engaging with the community helps us better understand their specific concerns and challenges, so we can best meet their needs. DEP partners with communities and residents through a diverse array of activities, such as:
- Regular dialogue with more than 100 local planning boards, monitoring committees, community organizations, and industry groups to inform the agency’s future capital investments, including an extensive effort to evaluate and select projects during the development of 12 Long Term Control Plans, Youth-focused educational programming, such as poetry contests, field trips to the watershed, inschool programs, and professional development trainings for teachers,

- Robust online interactions and media presence through our external website as well as social media platforms such as Facebook, Twitter, Flickr, Instagram, and LinkedIn, and
- Workshops for businesses on topics ranging from proper grease disposal to complying with the City's rules.

One example of an inventive public engagement campaign is Wait..., which taps into an active community interest in environmental stewardship by encouraging consumers to reduce water use in their homes with a timely text message during heavy rain events that cause combined sewer overflows (CSOs). Residents who receive these real-time notifications can take action to reduce their water consumption to help increase capacity in the combined sewer system and improve harbor water quality. DEP is the first water utility in the United States to pilot this type of program.

#### Energy Efficiency and Energy Generation & Recovery

Treating 1.3 billion gallons of wastewater every day requires a significant energy expenditure; DEP is the second largest municipal consumer of electricity in New York City. We have pursued an energy strategy that allows us to achieve operational savings and support the City's overall energy reduction goals while balancing the demands of energy-intensive operations at our water supply and wastewater treatment facilities.

Over the past four years, DEP has conducted energy audits at 40 facilities to identify nearly 400 energy conservation measures and has moved forward with 283 potential projects, of which 46 have been completed and another 17 are underway. Additionally, DEP is an active participant in the Demand Response Program, in which facilities reduce their electric load during grid peak periods to contribute to grid reliability and avoid brownouts and blackout events. The revenue generated by participating in demand response will be directed back to projects such as recharge and exercise spaces for the participating facilities.

DEP has launched or is evaluating a number of projects to generate and recover energy across the agency, including:

- operating a 1.0 MW solar power system and initiating a larger study of solar generation at other facilities,
- assessing the potential of a 14 MW hydroelectric facility at the Cannonsville Dam,
- upgrading engines and electrical equipment to support cogeneration at the North River, upgrading the Coney Island and Owls Head cogeneration facilities and evaluating co-gen at other wastewater treatment facilities and
- engaging in a three-year demonstration partnership with Waste Management and National Grid to digest up to 250 tons per day of organic food waste and return the excess gas into the natural gas distribution system.

#### Watershed Stewardship

DEP operates the largest unfiltered water supply in the United States, and over has an expansive watershed management program that includes source water protection, extensive research, and close collaboration with local partners to mitigate and study potential sources of pollution in the watershed. DEP also conducts more than 500,000 analyses annually to ensure that our drinking water quality meets or exceeds state and federal standards.

One of the defining features of DEP's watershed protection program is the Land Acquisition Program, which consists of purchasing land containing or near watercourses or other ecologically sensitive areas from willing sellers throughout the watershed. DEP has invested over \$606 million into the program since 1997, and has secured over 140,000 acres throughout the Catskill and Delaware watersheds, including land acquired in fee simple as well as conservation easements. Our watershed protection strategy also includes critical improvements to regional wastewater infrastructure, including the remediation of nearly 4,900 septic systems and \$400 million in improvements to wastewater treatment plants and other community wastewater solutions.

DEP has also pursued watershed stewardship within New York City's boundaries through a mix of green and grey programs that include nitrogen reduction upgrades at the wastewater treatment plants, green infrastructure, wetland restoration, and coastal protection projects such as oyster, eel grass, and ribbed mussel restoration. As a result of these measures, the New York harbor is the cleanest it has been in more than a century.

DEP continues to increase the resiliency of its wastewater infrastructure through capital improvements that reduce the likelihood of sewage spills and protect the harbor while hardening our infrastructure against the effects of climate change. Drawing upon experience gained from Hurricane Sandy, DEP created a Wastewater Resiliency Plan in 2013 that included new design standards for wastewater infrastructure and tailored cost effective measures to reduce damage in the face of future flood events. DEP expects to spend approximately \$315 over the next five years to ensure increased resiliency and reduced sewage releases during a storm surge.

#### Green Infrastructure

DEP prides itself on pursuing efficient programs that can simultaneously target many of the principles described above. The NYC Green Infrastructure Program is emblematic of how DEP has holistically embraced the Utility of the Future framework to address emerging challenges confronting the wastewater industry. Launched in 2010, DEP's hybrid approach couples cost-effective grey infrastructure with public and private investment in green stormwater practices that provide additional co-benefits. In 2016, DEP also began exploring opportunities to use green infrastructure in separately sewered areas to improve harbor water quality by filtering out pollutants from stormwater runoff.

By 2030, DEP anticipates more than \$2.4 billion of public and private money will be invested in source controls, such as bioswales, blue roofs, rain gardens, green roofs, porous pavement and rainwater harvesting, aimed at managing the first inch of stormwater across 7,800 acres. To achieve this ambitious goal, DEP:

- developed a robust bioswale construction program that has already broken ground on more than 3,400 green infrastructure assets citywide,
- awarded more than \$13 million to 31 projects through a grant program that supports green infrastructure development on private property
- promulgated a new rule that requires all new or substantially redeveloped properties to retain 90% of their stormwater on-site
- created a green jobs program that aims to hire 260 design and maintenance staff to manage the green infrastructure assets citywide, and is developing the "Adopt-a-Bioswale" program to foster stewardship of green infrastructure assets with residents and community groups.

## ORGANIZATIONAL CULTURE

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Employee Engagement: DEP’s 5,700 employees are engaged through a variety of programs, publications and events, including:

- the Always Creating Excellence (ACE) Awards, which recognize employees who have been nominated by their fellow colleagues for exceptional work in leadership, customer service, environmental health and safety, and innovation,
- the Pipeline Newsletter, which highlights major agency accomplishments and provides information on environmental health and safety, technology, and employee assistance services, and
- regular outreach from the Employee Engagement Office, which plans “quality of life” events (sporting events, boat cruises, holiday parties/luncheons) and agency-wide philanthropic activities (holiday toy drive, blood drives).

Environmental Health and Safety: DEP has achieved a high level of Environmental Health & Safety compliance and sustainability through the implementation of an aggressive audit and incident management program, which establishes continuous improvement targets, thereby resulting in a reduction in injury rates for 10 years in a row to a level that is 40% below the average for water and wastewater utilities. Further, DEP has recognized that one of the best ways to engage employees is to involve them in the development of safety and workplace violence prevention programs and policies (e.g., Labor management committees, Employee Recognition, near miss reporting and EHS suggestion programs). DEP provides education and professional development opportunities for operational and EHS staff alike by integrating safety education into a variety of learning platforms which exceed regulatory requirements.

Association Membership: DEP plays an active role in the broader national and international dialogue on stormwater and wastewater management. DEP holds active board membership roles in 28 organizations, including the National Association of Clean Water Agencies, Water Utility Climate Alliance, and Water Information Sharing and Analysis Center, and regularly presents at conferences to further the discussion of cutting edge technologies and anticipated industry trends. In the fall of 2015, DEP also signed a three year partnership with the City of Copenhagen to share best practices to manage increasingly intense rainfall patterns.

Succession Planning: DEP is developing an integrated Succession Planning program that seeks to retain and cultivate talented employees to take on critical positions in the agency. This approach will combine trainings, job shadowing/experiences and mentoring opportunities that develop institutional knowledge, technical capabilities, leadership abilities, and interpersonal skills.

Asset Management: DEP has been proactive in implementing various aspects of an overall asset management program including evaluating the agency’s assets to prioritize the capital replacement and rehabilitation projects necessary for the utility. DEP’s program utilizes a systematic methodology to prioritize projects for the agency’s Capital Improvement Plans. By conducting comprehensive inspection surveys which assess the physical condition and performance of facility assets, and then weighting these assets based on criticality, DEP has developed an efficient, cost-effective way to forecast replacement and rehabilitation needs of our assets.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Workforce Development and Trainings	Over 30 skills development trainings offered; 78,245 hours of formal training, plus 5,118 hours of emergency response readiness training in Fiscal Year 2015.
Employee Engagement	In Fiscal Year 2015: 62 Pipeline Newsletters, 13 employee recognition ceremonies, 10+ agency-wide engagement events (health fairs; blood drives; toy/food drives; holiday party, baseball game outing, etc.)
Employee Suggestion Program	229 suggestions submitted as of June 2016; 5 suggestions have been implemented agency-wide.
US Bureau of Labor Statistics Recordable Injury Incident Rates	DEP has been well below the average industry injury rate of 5.5 (# of recordable injuries x 200,000 / Total Hours Worked) for the past 4 years: 4.4 in FY13; 4.1 in FY14; 4.4 in FY15; and 3.7 in FY16 (July '15 to March '16).
EHS Facility Audits	From 2013 to 2015, DEP conducted 111 facility EH&S audits in our 100+ facilities. These audits identified 329 findings in total. By spotting EH&S deficiencies in our facilities, DEP is able to remedy these issues thereby increasing overall workplace safety.

**COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)

- Web presence established with social media engagement

Educational Programming Office: DEP's Education Office provides pre-K through college graduate level students, educators, and other stakeholders a wide range of free programs and resources about New York City's water supply and wastewater treatment systems, stormwater management, green infrastructure, citywide sustainability initiatives, sound and noise quality, and other topics. DEP staff have created online education modules, materials and models for museum exhibitions, watershed tours, and professional development training to offer detailed exposure to our water and wastewater systems to audiences of all ages and experience levels.

Water on the Go: Since 2010, DEP has partnered with community groups, arts and cultural organizations, and other City agencies, to bring portable outdoor drinking water stations to all five boroughs throughout the summer. These fountains are situated at high traffic locations, city parks and plazas, farmers markets, and special events, and effectively reduce the demand for bottled water and sugary soft drinks by providing plentiful drinking water for residents and visitors. As part of the initiative, DEP has collaborated with the Mayor's Office on a "B.Y.O." campaign dedicated to promoting reusable mugs, bottles, and bags and reducing landfilled waste.

Green Jobs: In 2015, NYC developed a "green jobs" program that will create 260 positions focused on designing and maintaining green infrastructure across the City.

Green Infrastructure Grants: Since 2011, DEP has offered a grant program to property owners who propose green infrastructure projects to manage one inch of stormwater runoff across combined sewer areas of New York City. Eligible projects include blue and green roofs, rain gardens, porous pavement, and rainwater harvesting.

#### *Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Participants in DEP Education Program	DEP reaches over 15,000 people annually, including students in pre-K to twelfth grade, teachers, and education professionals. As one example, DEP offers at least three annual tours of the Newtown Creek Wastewater Treatment Plant, including a Valentine’s Day Digester Egg Tour, to 900 visitors each year.
Community Engagement Examples: Lead Outreach, Long Term Control Plan Outreach, Grease Outreach	<p><b>Lead Outreach:</b> DEP attended 150 community board meetings to discuss lead testing, and held 70 general water quality briefings across all five boroughs for community groups. In 2016, DEP has also provided over 7,000 free lead test kits for residents interested in testing water quality in their homes.</p> <p><b>Long Term Control Plan Education and Outreach:</b> DEP convened 14 meetings in the past 12 months to solicit feedback from community members as part of the ongoing LTCP public participation process.</p> <p><b>Grease Outreach:</b> DEP has reached 35,000 households within the neighborhoods of Southeast Queens, an area that has traditionally encountered chronic sewer backup and flooding problems, through a combination of public meetings and a vigorous door to door education campaign.</p>
Water on the Go Program	Over the past year, DEP has set up 279 drinking water stations across all five boroughs of New York City.
Active Media Engagement on Twitter, Facebook, LinkedIn, Instagram, Youtube, and Flickr	<p><b>DEP has prioritized media engagement on Twitter, Facebook, and LinkedIn – follower stats as of June 2016 are:</b></p> <p>Twitter – 13,600 users  Facebook – 8,264 users  LinkedIn – 4,327 users  Additional platforms include Instagram (~500 users), Youtube (~400) and Flickr (~100).</p>
Green infrastructure Grant Program	\$13 M awarded to 31 projects since inception in 2011.

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy Efficiency in Project Review: DEP has instituted a systematic in-house review of projects to analyze energy impacts and greenhouse gas emissions for upcoming capital projects. DEP has incorporated the Envision Rating System to evaluate the social, economic, and environmental aspects of infrastructure projects and bring a triple bottom line assessment to all projects that do not fall under LEED criteria. We are also in the midst of a study to incorporate Energy Conservation Measures into State of Good Repair projects across our wastewater treatment plants.

Water Demand Management: DEP’s Water Demand Management Program is a multifaceted effort to reduce water waste and corresponding energy use at our wastewater treatment plants by funding fixture retrofits and sponsoring water conservation challenges in concert with our municipal partners, residents, and private businesses such as restaurants, hotels, and hospitals. In 2016, DEP launched a new water conservation challenge with three of New York City’s hospitals, who will work to reduce their monthly consumption by 5 percent, and will incorporate lessons learned from the challenge into a best practices guide for water management in all area hospitals.

DCAS Collaborations: DEP works closely with the NYC Department of Citywide Administrative Services on a number of programs to identify and fund energy conservation projects at DEP’s facilities and to track their efficacy over time.

Energy Research: DEP continues to research new technologies applicable to water and wastewater operations. We have previously taken part in several Water Research Foundation studies (Water and Wastewater Utility Energy Research Roadmap; Water Electric Utility Integrated Planning; and Regulatory Barriers for DER Integration for Water and Wastewater Utilities) and are currently conducting an energy-water nexus study. We have also partnered with local universities and colleges on studies related to the biological, chemical, and mechanical processes at our facilities.

Sustainable Infrastructure Construction: In 2015, DEP’s 26th Ward Wastewater Treatment Plant became the first wastewater treatment plant in the United States to receive an Institute for Sustainable Infrastructure rating award for an \$150M upgrade that included recycled and reusable materials, as well as new energy efficient main sewage pumps, process air blowers, and LED lighting, and a green roof.

*Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Department of Citywide Administration Services Demand Response Collaboration and Energy Conservation Projects	<b>Demand Response:</b> Goal of 20 MW reduced energy usage during peak hours when electric grid is stressed and at risk of a blackout. <b>Energy Conservation Projects:</b> DEP currently has 35 projects that are active or pending allocation, with \$60M awarded \$537K to be completed by the end of the 2016 fiscal year.
Energy Project Development Assessments	Goal of 30% energy reduction target for all relevant engineering projects by 2017; 80% by 2050.
Water Demand Management	<b>Retrofits:</b> In 2016, DEP funded 157 retrofits at schools, 190 retrofits at parks, and 7,875 replacements through the Toilet Replacement Program, and concluded a Water Challenge with participating restaurants that resulted in savings of more than 2.5 million gallons of water. <b>Water Reduction at DEP Facilities:</b> In addition, DEP hosted a Water Challenge at 7 of its 14 wastewater treatment plants, which resulted in a savings of over 300,000 gallons per day.
Electric Fleet	DEP has transitioned to solely purchasing hybrid vehicles for its light duty fleet, and, as of June 2016, has acquired 470 hybrid vehicles and 46 electric vehicles.
Energy Training Program	In 2015, DEP developed agency-specific energy courses through which over 100 employees have been empowered with knowledge of Energy Data and Billing, Measurement and Verification, and Boiler and Motor Efficiency.



## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Newtown Creek and National Grid Partnerships: As part of a three year demonstration project, DEP has partnered with Waste Management to process organic food waste at our Newtown Creek plant, and is working with Manhattan College to conduct sampling and research on operational effects of the organic food slurry. DEP is also collaborating with National Grid in a parallel public-private partnership to purify and beneficially reuse the biogas generated at Newtown Creek. Wastewater infrastructure is increasingly feeding into resource recovery operations of the future, and DEP continues to gather the data that will inform the transition, including developing an organics cost model to determine appropriate tipping fees if the agency were to accept organic food waste more broadly across our plants in the future.

Renewable Energy Studies: In 2016, DEP will launch an RFP to assess potential projects across the spectrum of renewable energy that could be sited in the city or our upstate watershed. Additionally, an RFI will be released in 2016 to assess the potential for innovative applications of solar PV systems at wastewater treatment campuses (over process tanks, on open land, on rooftops, etc.)

Port Richmond Upgrades: In 2015, DEP completed a \$30M upgrade to the Port Richmond facility that included activating one of the largest solar arrays in the City. The solar array generates ~ 1.02 Megawatts hours annually and supplies up to 25 percent of the plant's power needs. In addition, the upgrades have also allowed DEP to eliminate more than 28,000 metric tons of greenhouse gas emissions from our overall footprint by increasing the on-site beneficial use of biogas.

Cogeneration / Codigestion Analysis: DEP is undertaking an analysis to assess opportunities for greater use of biogas across our fourteen wastewater treatment plants.

### *Performance Measures & Results*

- Waste Management Project: DEP expects to process up to 250 tons of food waste at the Newtown Creek Wastewater Treatment Plant by 2019.
- National Grid Gas to Grid Project: Anticipated use of biogas as part of this gas to grid project will reduce greenhouse gas emissions by 16,000 tons of CO<sub>2</sub> annually.
- GHG Emissions: DEP has reduced its greenhouse gas emissions by 29% since 2008, an effective reduction of over 40% versus a business-as-usual scenario.
- Combined Heat and Power: A cogeneration system currently under construction at the North River Wastewater Treatment Plant is expected to reduce the Plant's greenhouse gas emissions by up to 14,000 metric tons of CO<sub>2</sub>e.

## **WATERSHED STEWARDSHIP**

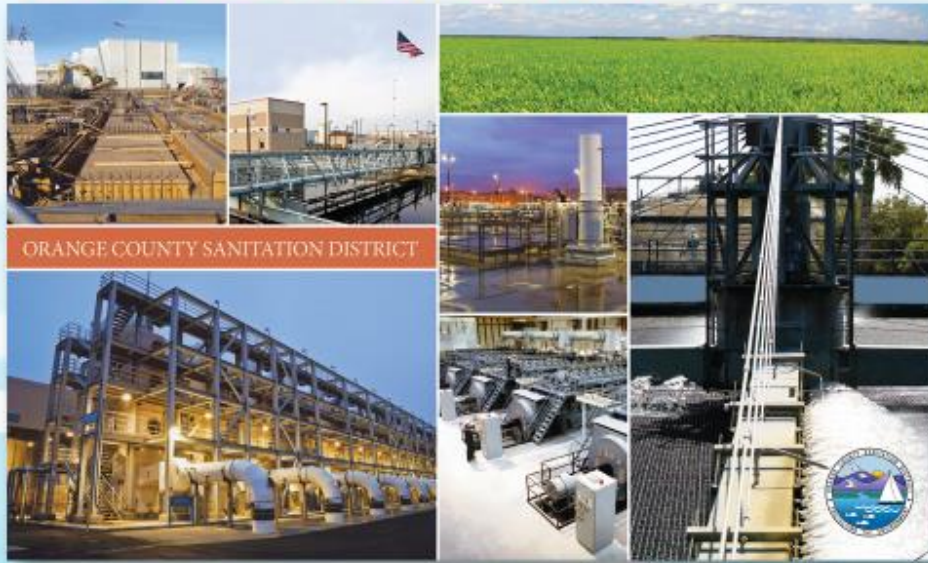
- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Bluebelts: DEP has developed and operated the Bluebelt program for more than 20 years. The Bluebelt program provides an urban stormwater management system by integrating pipe systems with constructed and existing streams, ponds, and other wetland areas and allowing them to perform their natural functions of conveying, storing, and filtering stormwater. Bluebelts provide drainage for more than 15,000 acres citywide and preserve open spaces and diverse wildlife habitats.

### *Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Land Acquisition Investments	Between 1997 and January 2016, DEP had invested roughly \$500 million in land acquisition efforts, securing over 140,000 acres.
Farm Leases	In August 2015, DEP celebrated the signing of its 100th Farm Lease upstate. Over the past 11 years, DEP has leased more than 3,700 acres to farmers who use the property for local agriculture and cultivation while properly managing the land to ensure continued watershed protection. This allows the City to both protect water quality while also being integrated into the working landscape and local economies which are interdependent with the watershed.
Whole Farm Plans	In 2015, DEP worked with the Watershed Agricultural Council to update 350 Whole Farm Plans.
Stream Management Program	<p>In 2015 DEP completed the following stream management projects:</p> <ul style="list-style-type: none"> <li>• Stream Management Implementation Projects (SMIP) – 29</li> <li>• Catskill Stream Buffer Initiative (CSBI) projects – 14</li> <li>• Stream Restorations – 1 restoration project (Stony Clove at Wright Road) and several repairs of previous restorations (from storm damage)</li> </ul>
Septic Rehabilitation	In 2015 DEP funded 276 septic rehabilitation projects.
Green Infrastructure	As of 2016, DEP has broken ground on more than 3,400 green infrastructure assets citywide.
Jamaica Bay Stewardship Updates	DEP has committed \$15 million towards salt marsh restoration in Jamaica Bay; was also awarded \$1 million grant from Department of Interior to improve water quality and improve and restore oyster population.

## Orange County Sanitation District CA



### Orange County Sanitation District CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Generation & Recovery
- ★ Water Reuse

Utility Description (combine all plants if a multi-site system)	
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): OCSD owns and operates a regional wastewater /dry weather urban runoff collections system and one wastewater treatment plant and one reclamation plant.	
Service Area (square miles): 479	Average annual daily flow (MGD): 185
Population Served: 2.5 million people	
Location	
Street Address: 10844 Ellis Avenue	
City: Fountain Valley	State: CA Zip Code: 92708
Contact Information	

Name: Jennifer Cabral	Phone: 714.593.7581	Email: jcabral@ocsd.com
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**NARRATIVE:** The Orange County Sanitation District (OCSD) is a public agency that provides wastewater collection, treatment, and recycling for approximately 2.5 million people in central and northwest Orange County. OCSD is a special district that is 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 has two operating facilities that treat wastewater from residential, commercial and industrial sources. OCSD manages 587 miles of regional sewers that collect and transport wastewater to either the reclamation plant in Fountain Valley or the treatment plant in Huntington Beach where it is treated, and sent for water recycling or released into the Pacific Ocean.

In recent years, OCSD has transformed from a sanitation district treating, collecting and disposing of wastewater to a resource recovery agency: capturing, recycling and reusing the products resulting from the wastewater treatment process.

**Water Reuse:** We are suppliers of new water. Water reliability is the foundation for a vibrant and growing economy, and OCSD has become an important part of maintaining water reliability in the region. Through our partnership with the Orange County Water District, OCSD has invested in and supported the development of the Groundwater Replenishment System (GWRS). In 2008, we made history with the commissioning of the GWRS, the world’s largest advanced water purification facility of its kind, which takes treated wastewater and purifies it to meet and exceed state and federal drinking water standards.

In 2015, the initial expansion of GWRS was completed. The Orange County Water District now receives 130 million gallons per day of secondary treated effluent from OCSD, in turn increasing GWRS water production from 70 million gallons per day to 100 million gallons per day. GWRS produces enough water to serve 850,000 people in Orange County.

Today, OCSD is reusing more than 50 percent of the total wastewater flow that we receive.

**Beneficial Biosolids Reuse:** We are producers of soil amendments for agricultural and future energy. The solids produced as part of the treatment process, known as biosolids, are recycled as soil amendment and compost for use on agricultural lands. Thirty years ago solids were viewed as a waste, now they are providing valuable nutrients to farm lands in Arizona and California.

OCSD’s biosolids program reduces expenses by using cost effective management tools. We closed out Fiscal Year 2014-15 at 94 percent of our allocated \$18.32 million budget for biosolids management, which includes hauling and offsite contractor costs. This resulted in an overall savings of \$1.1 million.

In addition, OCSD is proactive in researching innovative technologies to enhance beneficial reuse with efforts such as participating in a sub-pyrolysis system followed by a dryer to create an “e-fuel” that was used as a coal substitute at cement kilns where the ash was also used in the cement-making process in 2008; hosting the world's first tri-generation fuel cell and hydrogen energy station, which uses digestion biogas to produce heat, electricity, and hydrogen in 2011; and most recently exploring the possibilities at OCSD with the supercritical water oxidation process that high-temperature and pressure to convert sludge into water, carbon dioxide, nitrogen gas, minerals, and electricity, which will be used to help run

the plant at a 90 percent solids-to-energy efficiency, producing up to 80 times more energy than other conventional technologies.

**Energy Generation & Recovery:** We are energy producers. Gas produced in our solids processing digesters is utilized as a biofuel to operate the engines in the Central Generation facilities. These facilities produce approximately 66 percent of the electrical needs of OCSD's two treatment plants, saving \$6 million per year.

**Watershed Stewardship:** We treat dry weather urban runoff. Since 1999, OCSD, as part of a county-wide effort, has accepted, treated and properly disposed and/or recycled over 6 billion gallons of bacterial laden urban runoff from several coastal watersheds in Orange County to reduce bacterial impacts on Orange County's beaches. Dry weather urban runoff, without partnership with other agencies and diversions set in place, this runoff would otherwise flow untreated to our coastal waters.

**Community Partnering & Engagement:** We must be trusted and transparent. Our proposals must be compelling; and we must be engaged and familiar with the newest technology, and current trends. For these reasons, OCSD pursues public participation, which includes building collaborative relationships with elected officials, member agencies, the community, industry leaders, and the engaged public. Examples of these include OCSD's biosolids and odor control master planning stakeholder involvement. Community outreach efforts such as OCSD's award winning construction outreach program, educational program which includes hosting facility tours, speaking engagements and sewer science in the local high schools. These grassroots efforts are complemented with a strong government-advocacy program that gives OCSD a voice in ensuring that future regulations and legislation create cost-effective value.

**Organizational Culture:** The foundation by which all efforts are sustainably supported. We take pride in our commitment to protect public health and the environment. This commitment comes with the responsibility to ensure we have a clear strategic plan with defined individual goals that support the overall agency goals. OCSD has a 5-Year Strategic Plan that is supported by the General Manager's Work Plan, the Executive Management's Performance Goals, and individual employee performance goals.

Through this process it is imperative that we have engaged, capable, competent and hardworking employees. This lends to a transparent, trustworthy and competent organization – the brand of OCSD. Our employees make up our organization and the culture that we have. They are OCSD's ambassadors. We have 585 employees who are highly technical professionals. In 2010, 47 percent of OCSD employees held a Bachelor's Degree or higher. By 2014, that number had increased to 68 percent, of which 36 percent hold a Master's Degree or higher. We have a workforce made up of engineers, scientists, chemists, other specifically skilled professionals, and state certified operators and mechanics that are responsible for the delivery of our mission. Our commitment and belief in staff is significant. On average, each OCSD employee receives approximately 45 hours of training per year. That totals over 27,000 hours of training in areas such as safety, technical skills, soft skills, leadership programs and conference attendance. We have an incentive program that offers financial incentives for validated ideas that result in cost savings for the agency, an award program for living by OCSD Core Values, and a Safety Incentive Program to ensure we all go home at the end of our shift safe and whole.

To embrace and encourage the organizational culture we must communicate with our employees. OCSD has a robust internal communications program that expands beyond the supervisory and managerial relationship. OCSD's leadership has direct one-on-one relationships with their staff. These relationships

are a key piece of the puzzle to ensure OCSD's direction is understood, embraced, and followed on an ongoing basis, however it does not stop there.

The organizational employee communications program includes various methods to connect with our employees: daily through our intranet; weekly through "3 Things to Know," an email blast delivered every Monday; monthly through the "Digester," an internal bulletin posted in the restroom stalls; and bi-monthly through the "Pipeline," a printed newsletter distributed to staff via intra-office mail. These tools provide the opportunity to communicate with the organization as a whole about the long-term vision, current organizational goals and objectives, and issues that the agency is faced with.

We will continue to ensure appropriate investment in our workforce, resources, and infrastructure. This will result in increased efficiency and increased value to the community; and will ensure that we maintain a credible and influential voice with policy makers, regulators, and legislators.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

OCSD has partnered with Orange County Water District on the Groundwater Replenishment System to construct and operate the world's largest water purification system for indirect potable reuse that serves 850,000 people in Orange County.

Since 1999, OCSD has partnered with several coastal cities and the County of Orange to install dry weather urban runoff diversions to accept, treat and properly dispose and/or recycled over 6 billion gallons dry weather urban runoff to reduce bacterial impacts on Orange County's beaches.

OCSD has a Project Clearinghouse that provides an opportunity for staff to weigh in on new processes, innovations and designs before construction starts.

OCSD has an "Incentives for District Employee Achievements" (IDEA) Program that reviews staff submissions of ideas that offer solutions and fixes for inefficiencies, resulting in a cost savings to the agency.

Safety is a top priority and part of the organizational culture at OCSD. We have a dedicated Safety Awareness Program that ensures that working safely is on everyone's radar with safety tip reminders

and progress reports. We begin meetings with Safety Moments, feature Safety Quizzes on our intranet, and track completion of our safety training on a Safety Scorecard dashboard.

The Executive Management Team at OCSD is dedicated to measuring employee engagement levels. Therefore an Employee Engagement survey was conducted in Fiscal Year 2015-2016.

We periodically track our progress towards meeting Organizational, Strategic and Safety goals and milestones through our OCSDStat Program.

OCSD has a Mentoring Program for our employees and has begun partnering with other agencies in both mentoring and leadership skills development trainings.

OCSD asset management: OCSD maintains, rehabilitates, constructs infrastructure as needed to keep up with new compliance regulations and resource recovery opportunities.

OCSD has an annual \$1 million research program that supports innovative initiatives and encourages risk-taking. Two research examples are: the hydrogen fuel cell station that took hydrogen created from the wastewater process and was then used to fuel hydrogen vehicles. Currently, OCSD is researching the feasibility into Aquiritox,

#### *Performance Measures & Results*

- Contribute to employee development by providing quality leadership development and training opportunities that reach at least 70% of staff. Fiscal Year 2014-2015 = 86% of staff reached
- Percentage of recruitments resulting in internal promotions (since inception of efforts to train, develop and prepare staff)
  - o Fiscal Year 2011-2012 = 48%
  - o Fiscal Year 2012-2013 = 54%
  - o Fiscal Year 2013-2014 = 59%
  - o Fiscal Year 2014-2015 = 58%
- Employee Engagement Levels (First agency-wide Engagement Survey June 2016): Fiscal Year 2015-2016 = (TBD)
- IDEA Program: Fiscal Years from 1997-2015 = 361 IDEAS awarded with a first year savings of approximately \$1.6 million.
- Capital Improvement Program: \$150 M per fiscal year has been budgeted and forecasted to be spent for the next three fiscal years. \$100 million was spent during FY 2014-15 and \$136 M will be spent during FY 2015-16.

#### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use



OCSD was the first wastewater treatment agency to be certified to National Biosolids Partnership Platinum standards.

The OCSD Biosolids Policy includes commitments to research and implement ways to reduce the volume of biosolids; support recycling biosolids; and balances financial, environmental and societal considerations when making biosolids decisions.

In 2003, the Long-Range Biosolids Management Plan provided guidelines for biosolids management, which has resulted in two partnerships to build private merchant facilities, which minimizes risk to OCSD's capital. Although one of these facilities did not finish commissioning, it was an innovative approach that moved the biosolids industry a step forward and provided many lessons learned for the next generation.

The 2017 Master Plan is currently in progress and will update the capabilities of OCSD's facilities, processes, and strategic partnerships relative to biosolids management.

OCSD continues the 2003 recommendations of a diversified portfolio of offsite biosolids management options with multiple biosolids contractors, markets, and facilities. End use of the product includes: composting, direct land application, and landfill services. Fail-safe back-up options have been established to ensure that 100% of OCSD's daily biosolids production is handled in a sustainable manner.

OCSD demonstrates the benefits of biosolids compost by using it in the landscaping at the District facilities. Additionally, compost is made available to employees who are encouraged to share the results of their compost use via social media.

OCSD is Title 22 compliant, holds an NPDES permit, and regularly meets other regulatory requirements, including 40 CFR Part 503 Class B Pathogen Reduction and Vector Attraction Reduction.

OCSD won a 2014 graphics design award for its Biosolids Management Program Performance report brochure that communicated key information about our biosolids program to interested parties. OCSD continues to provide periodic stakeholder updates to relay program developments to interested parties, and track their input.

#### *Performance Measures & Results*

- Beneficial biosolid use: In 2015, 94% of all biosolids processed at OCSD were recycled.
- Carbon Sequestration via Class A and/or Class B biosolid land application: Nearly 13,000 metric tons of CO<sub>2</sub> (2014 BMPP)
- Land Use Applications: Biosolids provided by OCSD resulted in the substitution of 240,000 lbs of nitrogen (NO<sub>3</sub>-N) in 2015.
- Land Use Chemical Reduction: The potassium, phosphorus and calcium derived from OCSD provided biosolids resulted in reduced need for chemical fertilizers; and contributed to the production of 2.2 tons per acre of wheat, 3 tons per acre of oats, and 3.2 tons per acre of sudan.

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among

community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)

- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Community educational program that includes: tours, speaking engagements, and booths at community events.

Construction outreach program for projects that will impact businesses, residents, or commuters.

Active social media presence promoting ongoing agency efforts and messages.

Legislative and grants program to advocate OCSD's interests, consider sponsored legislation, and to seek funding for projects.

#### *Performance Measures & Results*

- Community Education Program: Fiscal Year 2014-2015 = ~10,000 people; 32 community events, 20 speaking engagements, 228 tours.
- Construction Outreach Program: Fiscal Year 2015-2016 (6 month period) = ~50,000; 29 notifications and 4 community meetings.
- Social Media: Fiscal Year 2015-2016 (6 month period) = 200 posts reaching over 21,000 people.
- Media Relations: Fiscal Year 2015-2016 (6 month period) = Published 15 news releases with over 500 articles in mainstream media.
- Legislative: Fiscal Year 2015-2016 (6 month period) = 40 bills tracked and analyzed, 11 Federal positions and 6 State positions.
- Grants: Fiscal Year 2015-2016 (6 month period) = \$1.4 million received from 2 grants.

#### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

OCSD has made a commitment to energy neutrality. A feasibility study for activities that can be undertaken has been assigned to the Process Engineering team (Business Accountability Charter, 1/11/2016)

OCSD has been generating its own power since 1993 and currently produces 66% of the power required for Plant operations. Each facility has its own Central Power Generation (CenGen) capabilities that can provide heat and power for the facilities through the combustion of digester (methane) gas. This process meets stringent South Coast Air Quality Management District (AQMD) emission standards thus allowing OCSD to minimize its purchase of grid power, resulting in \$6 million in savings annually.

In striving to meet AQMD air quality emission standards, OCSD demonstrated innovation and originality in upgrading our CenGen units, as catalytic converters are not commonly found on engines of this size.

OCSD central power generation creates a triple bottom line of sustainability: social and environmental (reduced emissions, decreased need to flare off digester gas as a waste product), and financial (decreased need to purchase power from the grid.)

#### *Performance Measures & Results*

- Increase Renewable Energy Use: OCSD uses more than 96% of digester produced methane gas annually to produce 2/3 of its internal energy (power) requirements and heat for digestion processes (steady state).
- Decrease dependency on power grid: More than 130 million kilowatt hours required annually by plant processes; OCSD produces an average of 89 million kilowatt hours resulting in a decreased dependency on the local power grid (steady state, 10-year average). Due to improvements in emissions reductions from central generation engines, OCSD will be able to increase internal power production capacity beginning in 2016.
- Cost avoidance: OCSD realizes more than \$6M in annual cost avoidance by producing its own power. Avoidance is realized by rate payers.

#### **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure

Groundwater Replenishment System (GWRS) – Reuse strategy has been in place since 1991 with influent processed as non-potable water for landscape irrigation. In 2008, a strategy was established to transition OCSD influent to potable water.

Public Outreach: “No Drugs down the Drain” and “What to Flush” outreach programs. Participation in community outreach events and presentations. Posting to social and traditional media sources. Hosting on-site tours that explain treatment processes.

In 2013, began using plant water to cool the facilities’ power generation engines. Currently, Plant 1 uses 5.5 mgd of plant water; and Plant 2 uses 4.1 mgd.

Continued effort to expand GWRS infrastructure capacity. 5-Year Strategic Plan (implemented 2013) included the goal of 100% water reuse (currently more than 50% of all Plant wastewater is recycled). WaterSMART grant secured for final expansion implementation activities.

Flow between OCSD's two facilities has been diverted to increase the flow at Plant 1. This resulted in an increased amount of secondary effluent available for processing by GWRS, increasing that system's capacity from 70 mgd to 100 mgd.

Co-Sponsor on California AB 2022 – Advanced purified demonstration water. This bill will allow for the bottling of 8oz bottles of reclaimed water to be used for educational and demonstrative purposes.

#### *Performance Measures & Results*

- Reroute flow from Huntington Beach Plant (ocean discharger) to Fountain Valley Plant (reclamation): Since 2014, flow has been rerouted from Huntington Beach Plant that would have been sent out into the ocean to the Fountain Valley Plant resulting in 25 mgd in wastewater processed for reclamation purposes.
- Beneficial Water Reuse:
  - 55 mgd is used for wet well injection;
  - 35 mgd is used for the saltwater intrusion barrier; and
  - 1 mgd is used for Green Acres Project (GAP) water.

## Orange Water & Sewer Authority NC



### Orange Water & Sewer Authority NC

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Energy Efficiency

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Drinking water, wastewater, and reclaimed water utility with single wastewater treatment plant (Mason Farm WWTP) and collection system		
Service Area (square miles): 31	Average annual daily flow (MGD): 8.1 (at WWTP)	
Population Served: Approximately 83,000		
Location		
Street Address: 400 Jones Ferry Road		
City: Carrboro	State: NC	Zip Code: 27510
Contact Information		
Name: Mary Tiger	Phone: 919-537-4241	Email: mtiger@owasa.org

**NARRATIVE:** The Orange Water and Sewer Authority (OWASA) is a community-owned utility that provides our customers with high quality and reliable water, wastewater, and reclaimed water services through the responsible and creative stewardship of the resources we manage. We provide excellent service so that if our customers could choose their water utility, they would always select OWASA. We are a trusted steward of the community, environmental, and financial resources we manage. OWASA serves over 83,000 people in the Carrboro-Chapel Hill, North Carolina community, including the University of North Carolina at Chapel Hill. Our employees are empowered in our quest for continuous improvement and innovation in serving our community and the environment.

We protect the environment through effective management and operation of our wastewater collection, treatment, water reuse, and resource recovery systems and manage our resources in an environmentally responsible manner. We recognize that our use of energy, particularly non-renewable energy, impacts land, water, and air resources across geographical scales, and that our use of fossil fuel-based energy sources contributes to increased greenhouse gas emissions, which contribute to climate change. Our use of energy is also a major direct expense to our customers. The OWASA Board of Directors has set goals to reduce OWASA's use of purchased electricity and natural gas, as well as to beneficially use the biogas generated in treating wastewater. Through our energy management program described in this application, we will work to achieve these goals by building on our past successes in energy management and applying systems thinking for future success.

We provide excellent service to our customers. We engage our customers and stakeholders and provide them meaningful opportunities to participate in decisions that are important to them. Since 2000, we have invested around \$9 million in odor elimination improvements, including construction of a bio-filter to treat exhaust air from the wastewater solids handling facility and covering and treating of exhaust air from the wastewater treatment plant's headworks, solids storage tanks, and biological treatment tanks. Our goal is to have no offsite objectionable odors from the WWTP, a goal we have made significant advancement towards in the last five years.

We provide affordable and high-value services by actively managing our costs and working with our customers to help them manage theirs. OWASA has an active affordability outreach program in partnership with local social service agencies that provide assistance to low-income members of the community. OWASA encourages a bill assistance program called Care to Share and a conservation initiative to empower low-income customers with the knowledge and tools that they need to reduce their utility bill by reducing their use.

The OWASA Board of Directors and staff have long recognized that to advance our quality, sustainability, and resilience, we must be a financially sustainable utility. To meet this challenge, we take a comprehensive, longterm view of our operating and maintenance requirements, rehabilitation and replacement needs, customer demands, revenue requirements, rate impacts, and other factors. Our financial sustainability framework includes five main strategies: (1) cost-of-service rates that promote the efficient use of resources and system capacity; (2) our Financial Management Policy; (3) our 15-year financial model and plan, including a capital improvements plan; (4) our comprehensive asset management plan; and (5) continuous improvement initiatives that improve operating efficiencies and reduce upward pressure on our rates.

We embrace the principles of environmental, social, and economic sustainability. We strive to make the highest and best use of our local water resources and to promote conservation of water, energy, and

other natural resources. In April 2009, OWASA began serving the University of North Carolina with reclaimed water to meet certain non-drinking water demands of the university (chilled water, irrigation of landscaping and athletic fields, toilet flushing). The University paid the cost to build the RCW system, excluding a \$1.6 million grant from the North Carolina Clean Water Management Trust Fund to pay for engineering design and permitting costs, and a \$625,500 grant from the US EPA to help pay for construction of the system. In 2015, reclaimed water accounted for approximately 9% of the water supplied to the community and approximately 28% of the University's total water demand.

The reclaimed water project has enabled OWASA to meet non-drinking water needs in a cost-effective manner while freeing up the community's drinking water supply and treatment capabilities to provide services consistent with the growth management and land use plans of the Town of Carrboro, the Town of Chapel Hill, and Orange County. We maintain open and positive communications with our governments and neighboring water utilities and cooperate in regional initiatives where appropriate and consistent with OWASA's commitment to our member governments.

None of this would be possible without our employees. We value our employees as our most important resource and provide them competitive compensation and a safe and rewarding work environment which promotes diversity and equal opportunity for all. We strive to provide secure jobs, a safe work environment, excellent working conditions, and meaningful opportunities for employees to participate in decision-making and in training and development programs. The health and safety of our employees is also of paramount concern. We have a comprehensive safety training program for all employees, and our safety record consistently exceeds the industry average.

Through our "How 2 OWASA" (H2O) education program, employees are provided the opportunity to attend a course of two-hour training sessions that provides an overview of the roles and responsibilities and interrelationships of the various departments and functions within the organization. We provide tuition assistance for employees seeking to advance their knowledge and skills through additional coursework. We encourage all employees to look for innovative and creative ways to save money and work more efficiently and incentivize this by cost-sharing the savings. We focus on growing our employees and engaging them in leading the organization.

We seek innovation and creativity in accomplishing our mission and enhancing our services. We work to inspire this innovation and creativity within the organization. A critical strategy in achieving this goal is AfterAction Reviews. In After-Action Reviews, we seek honest appraisal (from within and without the organization) on our performance and direct our efforts to correct shortcomings. AARs provide the opportunity to increase (transfer) knowledge and improve performance.

We believe that by working together with our community, industry colleagues, and researchers, we can achieve more and be more cost-effective than if we act on our own. We are fortunate to be in the backyard of leading national research institutions and welcome the use of OWASA's operations as a living laboratory for the advancement of the industry.

OWASA's leadership sets goals to lead change and advance continuous improvement. We achieve these goals by empowering our employees, partnering with the community, and strategically tracking our performance. We evaluate and incorporate the triple bottom line into our decision-making. It is from this foundation that OWASA has and will continue to be a Utility of the Future. The following application

highlights our commitment to an organizational culture that advances excellence and an activity area of excellence: energy management and efficiency.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Safety is OWASA’s number one priority. Every meeting starts with a safety moment, and every employee is required to complete 100% of their position-specific safety training that is provided on-site for OWASA employees. Employees are not only encouraged, but required, to call a safety time-out when an unsafe environment is detected. OWASA will be an early adopter of AWWA’s Partnership for Clean Water, a self-assessment and optimization program for wastewater utilities.

OWASA has worked hard to be in the final phase (Phase 4: Optimized System) of the water utility counterpart program, Partnership for Safe Water.

In support of OWASA’s culture for continuous improvement, we regularly conduct After-Action Reviews (AAR) to honestly appraise our performance and identify areas for improvement. AARs can be formal or informal, depending on the event, and they may include external stakeholders. AARs provide the opportunity to increase (transfer) knowledge and improve performance.

We hold ourselves accountable for our performance and value transparency in doing so. Each month, we publish and post a monthly report on Key Performance Indicators (KPIs) such as, biosolids recycling, budget performance, odor events, and safety incidents. This report is posted in our buildings and on our website, and directly sent to our Board of Directors and staff by email.

When OWASA leadership receives positive feedback regarding an employee, it is sent and celebrated with everyone in the organization.

Each year, approximately 12 employees participate in a fourteen week program called How2OWASA (H2O). Employees learn about the roles and responsibilities of every department and employee in the organization and build a cohort from field crew to directors.

OWASA’s Asset Management Program is used to assess and prioritize infrastructure improvements needed to achieve desired customer and environmental service level objectives, minimize critical asset failures, and ensure the long-term viability of the water, wastewater, and reclaimed water systems. The



Asset Management Program tools and practices we use to develop the CIP are aligned with industry best practices and guide our investment decisions.

The Employee Suggestion Program encourages employees to look for innovative and creative ways to save money and work more efficiently. Employees who submit specific solutions or improvements that reduce costs or have overall benefit to OWASA are eligible to receive cash awards or other special recognition if their ideas are accepted and implemented. OWASA also provides an Outstanding Achievement Award which may be earned by any employee or team of employees who accomplish an achievement that significantly benefits the organization.

OWASA's Mentoring Program is a voluntary program which connects employees at all levels of the organization and provides the opportunity to share personal and professional "lessons learned", provide organizational insight and learning opportunities.

#### *Performance Measures & Results*

- Open positions filled with internal candidates: 24 since 2010 (136.5 total positions); 5 in 2015
- Skill-based promotions: 17 since 2010 (136.5 total positions); 4 in 2015
- Average tenure of OWASA employees: Currently, the average tenure for OWASA employees is 12 years and the average tenure for the Wastewater Treatment plant staff is 14.6 years.
- KPI report published every month: Since May 2010, OWASA has published a Key Performance Indicator (KPI) report, posted it to our website, and sent it directly to our staff and Board.
- Number of employees that have completed How2OWASA: 68 employees have completed the How2OWASA program since 2011
- Percent of employees that complete safety training: Average completion rate for safety training in 2015 was 81%
- Example of After-Action: Review OWASA made changes in training, communication protocol, and instrumentation set-points following a mistake made in dosing hypochlorite into the reclaimed water system.
- Safety Incident Rate: For the past two and a half years, OWASA has maintained a safety record above and beyond its goal of a 3.5 incident rate.

#### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

In 2015, The OWASA Board of Directors set the following goals to lead OWASA's Energy Management Program:

- Reduce use of purchased electricity by 35% by the end of Calendar Year 2020 compared to the Calendar Year 2010 baseline
- Reduce use of purchased natural gas by 5% by Calendar Year 2020 compared to the Calendar Year 2010 baseline
- Beneficially use all WWTP biogas by 2022, provided the preferred strategy is projected to have a positive payback within the expected useful life of the required equipment
- Formally engage local governments and partners in discussion about potential development of a biogasto-energy project at the Mason Farm WWTP
- Seek proposals for third-party development of renewable energy projects on OWASA property, such as rooftop solar at the Administration Building.

Energy management and efficiency is evaluated for all equipment purchases and capital projects.

OWASA is developing a formal Energy Management Program that will include internal policies and procedures regarding employee education and awareness, progress tracking and reporting, and clean energy opportunity identification and evaluation. The evaluation criteria are being developed with the current Board of Directors and regional stakeholders.

In an effort to advance investments in energy efficiency and control costs, OWASA seeks outside funding support for energy management activities. We obtained a \$6.5 million, 20-year, no-interest loan from the North Carolina Clean Water Revolving Fund for installation of our new energy efficient blowers, mixers, and fine bubble diffused aeration system at the Mason Farm WWTP. Additionally, Duke Energy awarded OWASA a \$168,000 custom energy efficiency incentive for the project.

OWASA is beginning an effort to sub-meter energy intensive systems. At the Mason Farm WWTP, the blowers and reclaimed water systems are sub-metered. This allows WWTP operators to incorporate the energy impact of the decisions they make every day in running the plant. We will add more energy monitors next year. We track energy use and costs, and meet annually with Duke Energy to review electrical energy use and applicable rate schedules for each of our accounts. Where possible, we make adjustments to ensure we are being charged the most economical rates for each of our accounts. As a result of these reviews, we changed the power feed arrangement at the WWTP, which enabled us to avoid an annual cost increase of more than \$60,000.

The reclaimed water system has resulted in a decrease in average-day water sales by about 0.7 MGD. Assuming our current combined energy use rate of 6.05 kilowatt-hours per 1,000 gallons of water and wastewater treated, and factoring in the energy savings from using reclaimed water instead of drinking water, the reduction in our customer water demands corresponds to an estimated energy savings of about 200,000 kilowatt-hours every year.

We work to reduce the number of wastewater pumping stations. Since 2004, we have eliminated four stations by extending the gravity sewer system. The estimated energy savings has been about 18,500 kwh every year.

In early 2016, OWASA signed on as a partner in the Department of Energy's Better Buildings, Better Plants Challenge. In doing so, OWASA pledged to reduce its energy intensity by 25% against a 2013 baseline. Through our participation, OWASA hopes to arrange energy management-related training to plant staff and incorporate leading technologies into our everyday operations.

### *Performance Measures & Results*

- Total kWh used Since 2010, OWASA has reduced the amount of electricity required to treat the community's wastewater by 4.7 million kilowatthours: a decrease of 36%.
- Energy intensity: kWh per MG wastewater treated: Since 2010, OWASA's energy use to collect and treat one thousand gallons of wastewater has decreased by 2.19 kilowatt-hours. In other words, we have reduced our energy intensity by 41%.
- Beneficial use of the biogas generated in wastewater treatment developed in collaboration with the community: We are working to achieve this goal by 2020.
- Cost of energy OWASA spent about \$200,000 less on energy in Fiscal Year 2015, as we did in Fiscal Year 2010.

## ***Pima County Regional Wastewater Reclamation Department AZ***



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### **Pima County Regional Wastewater Reclamation Department AZ**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type: <b>Multiple facility regional system</b>		
Service Area (square miles): <b>392</b>	Average annual daily flow (MGD): <b>60</b>	
Population Served: <b>916,000</b>		
<b>Location</b>		
Street Address: <b>2955 W. Calle Agua Nueva</b>		
City: <b>Tucson</b>	State: <b>Arizona</b>	Zip Code: <b>85745</b>
<b>Contact Information</b>		
Name: <b>Jeff Prevatt</b>	Phone: <b>(520) 724-6040</b>	Email: <b>jeff.prevatt@pima.gov</b>

**NARRATIVE:** It is a pleasure to submit Pima County Regional Wastewater Reclamation Department (RWRD) for consideration in the Utility of the Future Today Recognition Program. RWRD is the second largest wastewater utility in Arizona and has undergone a transformational change over the past decade. Not only is our utility firmly committed to the principles embodied in the Utility of the Future concept, I firmly believe that we have created a culture of change throughout our organization, community and state.

Compelled by our commitment towards environmental stewardship and community obligations, RWRD chose to establish southern Arizona as a global leader in environmental technology, research innovation, and an industry leader with a constant emphasis on water quality. Beginning with the upgrade of our two largest treatment facilities in the midst of one of the largest recessions in decades, RWRD managed to deliver the largest capital improvement project in Pima County history on time and \$115 M under budget using alternative funding and project delivery methods.

Our greatest achievement however, continues to be in the building of broader relationships and collaborations within the community and throughout the water sectors through the creation of the Southwest Water Campus. The Water Campus houses our state-of-the-art regulatory compliance laboratory, dedicated employee development and training labs, industrial pretreatment program, permitting and compliance functions, data management, and research and development laboratories dedicated to water quality innovation. This multi-functional facility has become the central hub of our organization and is visited daily by personnel throughout our organization, other departments, universities and the community with water technology webcasts routinely broadcast from our often packed conference rooms.

The Water Campus has become our greatest strength in harnessing regional expertise and collaborations to create value within our organization, community and the greater water sector. The Water Campus concept is based on committed strategic partnerships among key organizations from seven area sectors: water utilities, universities, large corporations, emerging companies, federal, state and local governments. The Water Campus provides a geographic concentration of interconnected firms organized to promote technological innovation and our members recognize the importance of harnessing regional expertise of public utilities, research and business partners to encourage economic development while focusing on the protection of human health and the environment. This community partnering and engagement is crucial for economic development and is a profound change from the traditional role in which our utility's primary responsibility was one solely focused on environmental and public health stewards.

Through bold leadership, rigorous analytics and decision making, we continue to develop a powerful network of collaborations throughout the industry. This broader stewardship and collaborative role is already making significant differences statewide and continues to serve as an incubator for cultural change and fresh ideas about our industry. Throughout our organization we continue to see an increased emergence for staff development and new interactions and innovations consistent with the Innovation Ecosystem concept at the heart of the Utility of the Future: Blueprint for Action. These public-private partnerships and increased organizational interactions serve to create the network of benefits that builds and maintains a vibrant, technology-driven economy to influence positive change in the protection of human health and the environment.

RWRD is no longer a traditional, risk averse utility. We now openly seek out opportunities for innovation and technology advancements across the clean water chain to lead our industry forward in creating greater demand for reuse, biosolids and nutrient recovery.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Our utility has instituted a commitment to employee leadership in which all supervisors, managers and administrators complete a comprehensive 56-hour Leadership for Supervision Program.

Implemented a program in which all new employees complete a 40-hour On-Boarding Program that provides an overview of our utility and our role within the larger county organization, and an overview of the wastewater industry a whole. Each new employee receives detailed instruction about their specific job responsibilities including extensive safety education prior to reporting for their respective work assignment.

Established an innovative Business Coaching Program for supervisors, managers and administrators. The program includes 5-10 sessions with a certified business coach that provides unique and specialized feedback for individual employee development.

Implementing an extensive program to assess employee skills, knowledge and abilities within various functional areas including computers, technology, supervision, management, and general/basic education. The needs assessment program will continue to expand in scope to include many other

competencies and skills so that individual employee talents within our organization are recognized and put to best use.

Established an innovative Operations & Maintenance (O&M) Program for treatment staff. This program includes four months of extensive training on operations, laboratory analysis and preventative maintenance. There are six levels of training that include classroom and practical training in the field. This O&M Program has specific skill blocks for O&M supervisors.

#### *Performance Measures & Results*

- Annual employee training: FY 2014-2015 resulted in an average of 41 hours per employee.
- Amount of budget to support employee training and development: FY 2014-2015 results in \$1,800 per employee which is approximately 2% of the overall operations and maintenance budget.
- Number of supervisors to date completing the Leadership for Supervision Program: 23 teams have completed the Leadership for Supervision Program which includes a total of 185 RWRD supervisors to date.
- Safety Education: Reduce overall safety incidents each fiscal year. FY 2014-2015 resulted in 16 reportable safety incidents.
- On-Boarding Program: To date all new employees (100%) have completed the 40-hour On-Boarding program within 3 weeks of their date of hire.
- Non-utility personnel utilizing our employee development program: Our utility employs 464 full time employees yet last year we provided Leadership Training to 79 non-utility employees from other departments and provided computer based training courses to another 463 non-utility employed personnel.

#### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

We practice agricultural land application and mine tailing reclamation of Class-B biosolids from our multiple water reclamation facilities. The impediments to sustainability of practice include prohibition by ordinance, public dissatisfaction related to odors or a Class-A mandate by rule. Our utility's strategies to sustain the practice of land application include ongoing evaluation of innovation alternatives to produce Class-A biosolids and diversification of product and use.

Adhere to an Emergency Management System (EMS) document prepared with support from the National Biosolids Partnership program (NBP). NBP staff visited Pima County WRFs and trained the staff for EMS documentation and implementation. Our utility is committed to the NBP National Manual of Good Practice for Biosolids.

Commissioned a system-wide Biosolids and Biogas Master Plan, 2012.

Our utility is committed to R&D of alternative uses for biosolids and achievement of Class-A certification. An example is the partnership between Pima County, University of Arizona and Magna Gro Class-A EPA PEC Approval, 2013: PFRP Equivalency of the MagnaGro Process™ for the treatment of Dewatered Sludge/Biosolids at Pima County Green Valley Wastewater Reclamation Facility, Green Valley, AZ; study period 2008 - 2015

Undertook a thorough investigation of DryVac low temperature-vacuum drying of undigested sludge to produce Class-A biosolids, 2015.

Currently negotiating a pilot demonstration for a process known as EasySludge – A two-stage drying of undigested sludge to produce pelletized Class-A biosolids; the process utilizes a spiral dewatering system which recovers fluid, followed by a low temperature heat pump-based dryer. This activity is a joint Pima County- University of Arizona project; the period is 2016 – Ongoing.

*Performance Measures & Results*

Your Performance Measure(s)	Pima County Annual Results, 2015 - 2016			
	Year	2015	2014	2013
Percent of Biosolids beneficially used vs. total volume produced on an annual basis	Beneficial Reuse, %	98.7	85.3	100.0
Natural resources conserved through substitution	Annual Metric Tons in Biosolids to Agricultural Land Application			
	Total Phosphorus 383	Ammonia Nitrogen 49	Total Potassium 305	

**COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Our utility is actively engaged in statewide and national committees as well as local working groups that impact environmental permitting, water reuse, laboratory analysis, process control and emerging contaminant knowledge. Key management staff serve on the Arizona Panel for Emerging Contaminants. This is a panel to safeguard communities from non-regulated contaminants that have a potential for causing adverse public health.

Our utility is currently in year two of a five year program to engage citizens, and specifically high school students, to water quality issues and the significant roles water utilities play locally and nationally. This Bio-Science Academy reflects our utility’s commitment to continuous improvement, innovation and production of high quality water, and future workforce development. This Bio-Science Academy is a 4-



week (160 hour) program where local high school students have a comprehensive understanding of wastewater treatment, reuse and potable water sources and how our organization contributes to the Science, Technology, Engineering and Math (STEM) Program. These student interns receive college credit for the course and \$600 in compensation.

Creation of the Southwest Water Campus for research and innovation related to water sector advancements in technology, treatment and energy conservation through public-private partnerships. The Water Campus is a multi-functional facility and public meeting place for public outreach and workforce development and community awareness.

Active participation in Water Lab Alliance, Emergency Response Laboratory Network as well as statewide and national laboratory performance and accreditation programs. Provide laboratory analyses and workshops for various public utilities throughout the state.

Our utility led the way to create a regional Dispose-A-Med program targeted to keep unwanted medications from being introduced into the sewers. A more important objective of this activity is to reduce prescription drug abuse amongst teens and to educate the public about the dangers of prescription pill usage and the water quality nexus. Our program involves more than seven jurisdictional areas, several tiers of law enforcement and Native American communities.

Our utility has partnered with Pima Community College for employee development and outreach activities. Pima Community College provides instructors for the Leadership for Supervision Program and other continuing employee development programs and provides college credit for the O&M Technician Training Program and other specialized and technical training programs starting FY 2016-2017.

#### *Performance Measures & Results*

- Facility Tours and public meetings hosted at our Water Campus: Our facilities are open for hosting meetings for regulators, trade organizations and various public outreach events.
- Pilot demonstrations: With a total of eight WRFs, we typically are involved in at least three pilot demonstrations/evaluations each year.
- R&D opportunities: We are typically engaged in at least four research opportunities each year.
- Process improvement: Through our involvement with WERF's LIFT program, various working groups and R&D activities, we try to target one technology improvement annually to bring a project concept to full scale implementation.

#### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Currently participating in the U.S. Department of Energy’s “Better Plants” program. The program requires a commitment from participants to reduce energy intensity by 25% over a 10 year period. RWRD adopted 2014 as the base year for reporting energy intensity usage and has shown a reduction of over 8% thus far in the program.

Received a \$350,000 energy rebate from the local electric utility provider for energy efficient variable frequency drives, fine-bubble diffusers, and high efficiency turbo blower installations.

Commissioned an independent energy audit for our sub-regional wastewater reclamation facilities and implemented multiple energy conservation measures as identified in the audit.

#### *Performance Measures & Results*

- Total Primary Energy Consumed in MMBtu at the regional and 3 sub-regional treatment plants: An 8.06% reduction in energy intensity usage from 2014 to 2015. (About a third of the way to overall goal of reducing energy intensity by 25% by 2024.
- Greenhouse Gas Emission Reduction: The 8.06% energy intensity reduction resulted in a 3,893 metric ton reduction of greenhouse gas emissions.

#### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating) \*
- Conversion of digester biogas to electricity and heat, and/or transportation fuel
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

*\*Our utility had CHP recovery for over 30 years at our two largest facilities. Due to the recent expansion of these two facilities, and the required time necessary for air quality permitting, we discontinued the CHP. We continue have boilers in place for process and building heating and are negotiating cleaning our biogas to pipeline quality for reintroduction into the grid.*

Pima County Board of Supervisors has a published Action Plan for County Operations. One major goal is to have at least 15% of the electricity consumed by County facilities generated or offset by renewable sources. An additional goal of the Action Plan for County Facilities is for the Wastewater Department’s carbon footprint in fiscal year 2018/2019 to be less than or equal to the carbon footprint in fiscal year 2013/2014.

#### *Performance Measures & Results*

- Digester biogas beneficial usage: 21,000 MMBtu of digester biogas beneficially used for boiler heating per year.
- Solar electrical power utilization: 12,625 MMBtu of solar electrical energy utilized per year.

- Reduced non-renewable energy use: Reduced non-renewable energy use by 33,625 MMBtu per year
- Reduced greenhouse gas emissions as a result of renewable energy utilization: Reduced greenhouse gas emissions by 6,926 metric tons.

## **NUTRIENT & MATERIALS RECOVERY**

- Materials recovery strategy established and communicated with utility employees
- Adequate staffing to support materials recovery program (contractual or in-house)
- Market assessment conducted for recovered materials
- Contracts or agreements in place for materials provision
- Ongoing exploration and evaluation of materials recovery opportunities

Biogas Recovery and Reuse – Final contract negotiations underway with a private contractor to recover, clean and reuse biogas. Recovered biogas will be used to supplement the grid.

Actively managing WERF project NTRY9T15, Sustainable Struvite Control Using Residual Gas from Digester Gas Cleaning Process.

Final contract negotiation stages underway with Ostara for phosphorus harvesting with revenue generated from the sale of recovered phosphorus.

Total trihalomethane abatement through the beneficial use of centrate side stream as a source of ammonia for controlled chloramination which subsequently reduces chemical chlorine usage.

Performing a multi-site residual sulfite study for the Arizona Department of Environmental Quality to revise the operational performance and analysis of residual chlorine for reducing chemical usage and minimizing chemical discharge to the environment.

Actively engaged with the University of Arizona, LIFT and Test-Bed Network to pilot and evaluate new technologies for nutrient recovery and sale.

### *Performance Measures & Results*

- Biogas recovery and resale: Cease flaring of excess methane while generating revenue of approximately \$175,000 annually.
- Struvite mitigation: Reduction in ferric chloride usage and struvite related maintenance activities for an estimated savings of \$150,000 annually.
- Struvite harvesting for resale: Estimated revenue will be \$150,000 annually.
- THM abatement: Documented reduction in hypochlorite usage and bisulfite usage for an estimated savings of \$250,000 annually.

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure

- Building code changes to enable reuse (e.g., reuse water code)

Our utility is actively involved in potable reuse working groups and developing a statewide potable reuse public outreach for initiating public discussions about potable reuse.

Our utility produce over 60 MGD for on-site beneficial use and for the turf irrigation needs for 18 golf courses, 50 community parks, 65 schools and aquifer recharge.

With the expansion of our facilities to produce the highest designated water quality, Class A+, we have greatly expanded the reuse potential to include open access landscape irrigation, irrigation of food crops, fire suppression, cooling tower water and toilet flushing capabilities.

The Water Campus laboratory analyzes over 48,000 analyses annually to ensure reuse water quality.

#### *Performance Measures & Results*

- Groundwater recharge and storage credits: Monitor the accrual of long term storage credits. A total of 24,533 acre ft of long term storage credits were accrued in 2015.
- Beneficial reuse environmental benefit: A total of 17,632 acre ft of water was beneficially used for turf irrigation of schools, parks and golf courses in 2015.
- Environmental restoration with reclaimed water: Reuse of 238 acre ft in environmental restoration projects throughout the metropolitan area.

#### **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

In association with other County departments, we created the Sonoran Desert Conservation Plan which balances the conservation and protection of our cultural and natural resource heritage with our efforts to maintain an economically vigorous and fiscally responsible community. Broadly, the SDCP considered the elements of critical habitats and biological corridors, riparian areas, mountain parks, historical and cultural preservation, and ranch conservation in forming a viable land management plan for the County. The Multi Species Conservation Plan approved by USF&W is the part of the SDCP that deals with compliance with the Endangered Species Act.

Collaborated with local water providers to establish a regional Water Infrastructure Sustainability Study that used triple bottom line approach to determine strategic action. Areas identified for action included

Water Supply, Demand Management, Respect for the Environment, and Comprehensive Integrated Planning. Plan implementation was integrated with Water and Land Conservation/Management aspects of Pima County's current Sustainable Action Plan.

In association with multiple County departments and the Pima Association of Governments, we collaborate to achieve watershed improvements throughout the region. Construction Stormwater Management, Multi-sector General Permit Stormwater Controls, Rainwater Harvesting, Flood-prone Land Acquisition Program, and Low Impact Development are representative areas targeted. Multiple Pima County departments share responsibility for routine inspections, compliance, workshops, outreach materials, and even code modifications to promote water recycling and water harvesting are part of the annual MS4 reporting to ADEQ and EPA.

Our utility also employs an ADEQ-approved Capacity Management Operations & Maintenance (CMOM) Plan to address SSOs as well as other environmental aspects of conveyance system management.

Utilize an integrated program to address wet weather issues, including such sources as regulated stormwater, unregulated runoff (nonpoint sources), SSOs, peak flow at POTWs, and source water protection.

Actively lead the Lower Santa Cruz River Basin Study, a federal grant-funded multi-partner analysis of water resources in the watershed for the purpose of developing a strategy to improve water reliability for municipal, industrial, agricultural, tribal/cultural, and environmental sectors. This project is a three-year climate-model and scenario-planning process that will project impacts of future drought, as well as Colorado River CAP shortage. The expected outcome is a set of recommendations for infrastructure improvements to accentuate water resource resiliency and sustainability throughout the regional watershed.

Our utility, in association with fellow County departments, instituted the Living River Project which is an annual assessment of the wetland conditions created and impacted by the effluent from our upgraded wastewater reclamation facilities. Three reports have been done so far to measure 16 indicators of river health along a 23-mile stretch of the Santa Cruz River. Improved water quality is changing the effluent dependent Santa Cruz River into a setting where healthier aquatic habitat is possible and increased infiltration in the Lower Santa Cruz Managed Recharge Project, also a byproduct of improved water quality, means that aquifer replenishment is enhanced.

#### *Performance Measures & Results*

- Increase Managed Recharge Infiltration: 57% increase in recharged effluent since 2013.
- Improve Aquatic Health of Santa Cruz River: Increased macroinvertebrate and amphibian diversity, presence of pollution sensitive species, and appearance of new fish species.
- Improve Water Conservation & Management: Reduced potable water use for irrigation by replacing with reclaimed water. New landscape irrigation projects and green buildings use predominantly gray water, harvested rainwater, and reclaimed water.
- Augment riparian restoration/green infrastructure acreage: Total of 340 acres of riparian habitat supported with reclaimed water – Target of 715 acres by 2025.
- Retain stormwater on-site: Capture of sediment and other stormwater pollutants.

## ***Sacramento Regional County Sanitation District CA***



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### **Sacramento Regional County Sanitation District CA**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**

<b>Utility Description (combine all plants if a multi-site system)</b>		
Type: Regional Wastewater Conveyance System and Treatment Plant		
Service Area (square miles): 250	Average annual daily flow (MGD): 150	
Population Served: 1.4 million		
<b>Location</b>		
Street Address: 10060 Goethe Road		
City: Sacramento	State: CA	Zip Code: 95827
<b>Contact Information</b>		
Name: Bernie Creelman	Phone: 916-876-6071	Email: creelmanb@sacsewer.com

**NARRATIVE:** Applying for recognition in the Utility of the Future Today program has shone a light on what we have already accomplished, what we still need to do, and the role organizational culture plays in embracing the attributes of a utility of the future. Sacramento Regional County Sanitation District (Regional San) has always been dedicated to protecting the environment through its primary mission of conveying and treating wastewater before releasing it to the Sacramento River. Already a visionary during design of the regional wastewater treatment plant in the 1970s, Regional San purchased 2,650 acres of land surrounding the plant to not only provide a buffer between future neighbors and plant nuisances, but also to protect this rich riparian and wildlife habitat from urban intrusion. Further, Regional San has been recycling methane, water, and biosolids for more than a decade while supporting other regional environmental programs and activities in response to our clear mission.

As the largest wastewater treatment agency in Northern California, Regional San leadership prides itself in embracing opportunities to be a regional leader in environmental stewardship. We always keep an eye on innovative opportunities to improve environmental health and overall long-term resource sustainability and have partnered with myriad other agencies and environmental stakeholders to achieve larger regional and watershed-conservation goals. Yet, according to our mission statement, our foremost commitment has been to convey and treat wastewater in the most cost-effective manner possible. Certainly, the recent recession, when belt-tightening became the budgetary mandate, required close scrutiny of program costs resulting in temporary reduction or postponement of non-primary objectives. However, with economic recovery, a new vision has arisen focusing on sustainably energizing our employee culture, refocusing our strategic plan, and updating our mission and vision.

While Regional San as an organization has embraced its environmental role, staff hasn't always been eager to commit limited resources to often costly sustainability programs. Seldom is "doing the better thing" the cheapest or easiest course of action, and with approximately 480 employees, Regional San's

work culture is highly diverse with a large spectrum of work priorities and visions. That's where organizational culture with strong, focused leadership plays such a vital part in today's sustainability commitments and in tomorrow's vision and priorities.

Recently, Regional San leaders initiated an effort to update the organization's 10-Year Strategic Plan, which involved interviewing representative staff from all departments as well as external stakeholders. From the interviews came both kudos and criticism that contributed to a more focused strategic plan and clearer vision for the future. Key improvements include promoting environmental sustainability and resource recovery; fostering a culture that makes Regional San a workplace of choice; continuing to protect the Sacramento River Watershed through holistic and sustainable approaches; and enhancing Regional San's effectiveness and visibility through increased regional partnering and collaboration.

Central to the strategic plan, Regional San's mission statement has been updated to reflect a deeper commitment to conservation and resource recovery as well as cost-effective public health and environmental protection. Our revised vision will include being a trusted partner in environmental stewardship and regional sustainability, and our values will reflect greater commitment to environmental, financial, and staffing sustainability. To achieve our refocused vision and values, specific goals have been identified including improving communication with external stakeholders and the local community; lending experience and expertise to increased regional communication, coordination, and collaboration; and working earlier and more frequently with regional partners on issues to improve environmental sustainability, including opportunities for increased use of recycled water and development of low-impact and green infrastructure. Our internal goals include employing the most effective and efficient business practices, managing our assets responsibly, and ensuring continued financial stability and fiscal responsibility.

Thus, we are at a point of cultural transition. While our programs and accomplishments reflect a past commitment to environmental stewardship and recycling, our new objectives are focused on larger picture sustainability as central to our workplace values, and thus rank higher when considering projects for the future. We are embracing being "green" and "sustainable" as central to our identity, not with disregard to the financial cost to our ratepayers, but as a larger value at the core of our business model. And these values are already being communicated to our staff. With the recent roll-out of our employee "Going Green" program, we aim to encourage and educate our employees to further embrace environmental stewardship 24-7, not just during a typical work day. Little changes can have huge results...especially, if everyone is onboard.

Meanwhile, we continue to invest in our employees through efforts such as our Leadership Academy and Wholeness Development Program, Employee Wellness and Safety Programs, Wastewater Treatment Plant Operators Training Certification and Staff-Rotation Programs, succession planning, and staff education, development, and recognition opportunities. We continue to assure our financial sustainability through our well-established asset management program, long-term financial planning and annual financial reviews, low-interest funded loans, maintenance of a cash balance equal to 1,200 days of operating cash-on-hand, and innovative debt management.

Highlights of our other Utility of the Future Today activities include:



**Beneficial Biosolids Use:** Since 2004, Regional San has recycled on average 30 percent of our processed biosolids yearly. During 2015, we exceeded our service level goal of 3,650 acres fertilized by producing biosolids to fertilize 3,803 acres.

**Community Partnering & Engagement:** Regional San engages and partners with stakeholders that include regulatory agencies, POTWs, stormwater utilities, agriculture interests, water suppliers, environmental justice groups, pharmaceutical interests, pesticide manufacturers, environmental organizations, and conservation groups. Examples of this activity include a unique partnership with The Nature Conservancy to promote habitat-restoration efforts through the use of recycled water to irrigate agricultural and conservation lands; partnering with the Elk Grove Unified School District and other agencies and community groups to develop student education and work-experience opportunities utilizing two historic properties located on the Bufferlands; partnering with local environmental groups, universities, researchers, and farmers to enhance community education, wetlands restoration, and research opportunities on the Bufferlands; becoming a founding funding partner for the Powerhouse Science Center to build a new, regional science/environmental learning museum; and actively engaging in leadership positions with a variety of local, state, and national agencies to promote water quality and environmental stewardship.

**Energy Efficiency:** Since 2005 Regional San has actively sought solutions for energy reduction and improvements through its energy management program. Through energy optimization and forecasting, the wastewater treatment plant has saved approximately \$400,000 per year and continues to monitor and look for additional opportunities to reduce energy usage.

**Energy Generation & Recovery:** Since 1996 Regional San has recycled biogas, generating enough energy to power 5,800 households per year. In March 2016, Regional San improved facilities and established operating procedures to receive fats, oils, grease, and other liquid food waste for codigestion to enhance recycled biogas production. In late 2016, a 4 MW solar panel array will be installed at the plant to generate clean energy that will replace eight percent of the plant's electrical usage. Regional San continues to investigate innovative green energy alternatives.

**Water Reuse:** In 2003 Regional San began operating a 3.5 MGD onsite water recycling facility to irrigate local parks, landscape medians, and school fields. In 2004 we established the goal to increase water recycling up to 40 MGD over the next 20 years. Several water recycling projects are currently underway that will increase water recycling to 56,300 acre feet/year. As well, treatment plant upgrades that will be complete in 2023 will produce Title 22 tertiary treated recycled water for all of the plant's effluent, opening opportunities for substantially more water reuse.

**Watershed Stewardship:** Regional San participates in a variety of legislative and regulatory forums and programs to promote sensible policies regarding watershed management activities, including proper disposal of pharmaceuticals and pesticides; promotion of water reuse projects; development of regional monitoring programs; and research and sound-science decision-making for the Sacramento/San Joaquin Bay Delta. Other Regional San collaborations involve developing water-quality report cards to educate the public on the health of local waterways; providing funding for the purchase of low-flush toilets; supporting additional research on the risk, fate transport, and potential environmental impacts of trace organics; working with manufacturers to support product-stewardship efforts to evaluate entire lifecycle cost of products; and securing \$10 million of grant funding and continued support to develop the

Sacramento River Watershed Program. Regional San has dedicated Legislative & Regulatory Affairs, Scientific Research, and Wastewater Source Control staff.

Becoming a Utility of the Future is a process that, once embarked upon, will 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.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Going Green Employee Program: A new program that aims to educate/encourage employees to be environmental stewards and make environmentally sustainable choices at home as well as work. Includes bulletin boards, intranet site, lunchtime speaker series, suggestion boxes, donated goods collections, etc.

Employee Wellness Program: Encourages sustainability of our employees by educating on healthy lifestyles and choices. Before/after work and lunchtime programs ongoing. Fitness gyms at work sites and classes presented by fitness consultants. Partnering with health agencies for heart health, smoking cessation, diabetes prevention, etc.

Leadership Academy: Designed to provide present and future leaders with skills and knowledge to motivate staff to continually meet business demands in the midst of constantly changing economic conditions, environmental needs, and public expectations. Competencies include Motivating Others to Mobilize Commitment; Managing and Measuring Work; and Managing Vision and Purpose; as well as general leadership skill building.

“Whole-person Development” employee learning groups: Focus on relationship between conscious/unconscious mind and effect on productivity, interpersonal relationships, communication, motivation, and attitude. Combine theory with practical tools, including nutrition, breathing, mindfulness meditation, visualization, aromatherapy and reflection exercises.

Succession planning and robust staff development: Forecasts staff attrition and retirements to ensure a sustainable work force. Staff routinely reviews job classes and duties, assesses probationary periods,

and develops job-specific training to respond quickly to changes in the workforce to hire, retain, and assign competent, qualified staff.

Wastewater Treatment Plant Operators (WTPO) training certificate program: Specific class series established to create a professional operator that has a range of skill sets and knowledge. Operational Training Guides were developed to standardize essential information and procedures and provide continual training for operators to maintain the highest level of performance possible.

Staff Rotation Program: Builds an optimally skilled work force through cross-training and broad work experience that supports employee development and aids staff retention. Orients new employees, provides additional job training, and enhances career development as well as staff communication and productivity.

Intra- and inter-departmental team-building encouraged and budgeted: Aims to communicate staff appreciation and team-building. Happy employees that feel appreciated are long-term, productive, and creative problem-solving employees.

Business Case Evaluations/Project Authorization Committee: Fully implemented asset management program that requires projects and programs costing more than \$10,000 to undergo in depth asset management, cost, and impacts-analysis before approval and implementation.

Financial sustainability: Asset management, long-term financial planning, yearly review of financial plan, Comprehensive Annual Financial Reports, audits, early pay-off of loans/bonds, etc.

Investigating innovative energy, waste management, and resource recovery technologies such as advanced anaerobic digestion, organics recovery from solid waste for increased biogas, use of wind turbines, algae biofuel, and fuel cells as alternative energy options for the wastewater treatment plant.

Safety Program Office: Dedicated to maintaining a safe and healthful work environment through the implementation of sound safety and health practices.

#### *Performance Measures & Results*

- Going Green program start-up: Six bulletin boards with suggestion boxes being installed. Speaker events scheduled for summer 2016. Intranet site under construction.
- Staff Rotation Program: First five staff members currently in staff rotation program, and two follow-up meetings held to monitor success of program.
- WTPO Training program Hired and trained: 48 operators since course inception in 2005 using Operational Training Guides and plant's current curriculum; 16 of 48 have taken additional coursework to promote to Senior WTPO or WTPO Supervisor.
- Leadership Academy: 127 staff participants; coursework for six competencies; 18 competency introduction courses; three application courses.
- Safety Program: All employees required to attend monthly safety education meetings. Robust injury-prevention program. All injuries investigated and addressed. Injury and near miss metrics in place.
- Whole-person Development Program: Since 2014 12 participants/year participated in 13 workshops and 24 discussion groups; 84 participants in brown-bag events; 45 managers participated in presentation at recent quarterly briefing. Concepts/techniques also presented by

staff at 2015 Utility Management Conference in Austin, TX, and CWEA Northern Regional Training Conference.

- Financial Sustainability: Fund loans at interest rates between 1.6-2.3% for 30 years. Paid off Comprehensive 10-Year Financial Plan updated yearly: on target with maintaining \$300 million cash-balance equal to 1,200 days of operating cash-on-hand; debt coverage remains above 1.2 and is increasing yearly; innovative debt management, including securing \$1.6 billion in Clean Water State Revolving \$50 million variable-rate debt on May 31, 2016. AA credit rating maintained.

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

26,000 dry tons Class A biosolids processed yearly. About 30% of total biosolids are recycled. Service level established and met: enough to fertilize 3,000-3,650 acres/year.

Partnered with private firm, Synagro, to design, build, and run on-site facility and market biosolids for 20 years.

Regional San originally conducted outreach to farmers, general public, and community leaders. Synagro now handles all outreach.

### *Performance Measures & Results*

- Yearly service level Exceeded service level in 2015: 3,803 equivalent acres/year recycled

## **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Regional San (RS) typically engages and partners with stakeholders that include regulatory agencies, POTWs, stormwater utilities, agriculture interests, water suppliers, environmental justice groups, pharmaceutical interests, pesticide manufacturers, environmental organizations, and conservation groups. Examples include:

- Promoting habitat-restoration efforts through the use of recycled water to irrigate agricultural and conservation lands. A unique partnership is being forged with The Nature Conservancy.
- Actively engaging in leadership positions with a variety of associations to promote water quality and environmental stewardship, including CASA, CVCWA, NACWA, RWA, Metropolitan Chamber of Commerce, CWEA, WaterReuse, ACWA, BACWA, SCAP, CASQA, Aquatic Science Center, WERF, WEF, the Farm Bureau, the Rice Commission, and Northern California Water Association.
- Partnering with a variety of regulatory agencies promoting sound science and environmental stewardship, including the CVRWQCB, SWRCB, Delta Stewardship Council, Delta Science Program, Department of Water Resources, CA DFW, CA Water Commission, USFWS, NMFS, and USBR.
- Engaging with a variety of Environmental Organizations including The Nature Conservancy, Clean Water Action, The Bay Institute, NRDC, Sierra Club, the Planning and Conservation League, Ducks Unlimited, and Sacramento Water Recycling Coalition.
- Forming community partnerships (e.g., Elk Grove Unified School District, Elk Grove Historical Society, Farm Bureau, UC Davis Extension Master Gardeners Program) to create a community asset of two historical properties located at the Bufferlands surrounding the wastewater treatment plant.
- Partnering with local environmental groups (e.g., Audubon Society, Laguna Creek Watershed Group, Native Plant Society, Sacramento Stormwater Quality Partnership, Business Environmental Resource Center, Sacramento Area Creeks Council), universities, researchers, and farmers to enhance community education, wetlands restoration, and research opportunities on the 2,650-acre Bufferlands.
- Robust Public Affairs Office responsible for education/outreach to customers, stakeholders, board of directors, and policymakers. Implements project communication strategies; coordinates public meetings and events, and strategic communications; conducts public surveys; manages social media and Web sites; manages hotlines; etc.
- Sewer Lifeline Rate Assistance Program developed in mid-1990s. Continues to be among most robust and user-friendly assistance program in region.
- Resulting from a flow and load monitoring study, the new Age-Restricted Development Rate & Fee Category recently created and outreach to potential qualified customers underway.
- Becoming a founding funding partner for the Powerhouse Science Center to build a new, regional science/environmental learning museum.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Partnership with Regional Water Authority</i>	Provides rebates for replacing high-water consumption fixtures with water-efficient fixtures.
<i>Partnership with Synagro</i>	Since 2004, partnered with private firm Synagro to recycle 3,000-3,650 acres/year Class A biosolids.
<i>Echewater Treatment Plant Upgrade outreach</i>	451,457 newsletters mailed in 2015.
<i>South County Ag Water Recycling Program outreach</i>	200 postcards mailed to farmers in 2015.

<i>Program Outreach Bill inserts</i>	440,000 Don't Flush Your Meds, 440,000 Prop 218/Plant Public Tours, and 424,350 Household Hazardous Waste/Be Mercury Free inserts included in bills in 2015.
<i>Public hotlines supported</i>	Be Mercury Free, Don't Flush Your Meds, Amalgam Recovery, Recycled Water Fill Station.
<i>Solar energy project support</i>	503 postcards mailed, one public meeting.
<i>External Presentations</i>	Building Connections Construction Expo; Citrus Heights Kiwanis Club; Elk Grove City Council; Association of Environmental Professionals; Rotary Club of Walnut Grove; Local Agency Formation Commission (LAFCo); Sacramento County Farm Bureau.
<i>Facebook page outreach</i>	"Tuesday Trivia" uploaded weekly.
<i>Public outreach events in 2015 to support Pollution Prevention</i>	Supported 10 events in partnership with Sacramento Area Sewer District.
<i>Wastewater Treatment Plant Public Tours</i>	Conducted six public tours and 15 specialized tours in 2015.
<i>Low-interest loan program established</i>	Loans to local homeowners to convert septic systems to public sewer.
<i>Sewer Lifeline Rate Assistance Program</i>	Provides rate assistance to 14,000 low-income Regional San customers.
<i>Age-Restricted Development Rate &amp; Fee Category</i>	New rate/fee category established March 2016. Outreach underway to approximately 150 potential qualified developments. Seventy have applied to date.
<i>Supporting local business contracting</i>	Since 1993, approximately 2/3 of Regional San's prime and secondary contractors have been local businesses. Regarding EchoWater Treatment Plant Upgrade, several steps taken to provide opportunities local contractors including large number of small and mid-sized projects that fit with smaller, locally based contractors and the use of local labor and conducting contractor open house and outreach meetings.
<i>Wastewater Treatment Plant Operator Internship Program</i>	Internship opportunities for Folsom Lake College students that provide real work experience and future opportunities for employment.
<i>Powerhouse Science Center</i>	Obtain 20 years of exposure for wastewater management and environmental messages/exhibits.

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff

- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy management program established at Sacramento Regional Wastewater Treatment Plant (SRWTP) in 2005 to improve/reduce energy usage. Electric meters installed on key systems to gather usage info that was used to optimize use and forecast energy budgets.

Comprehensive 3-, 5-, 7-year plant energy-usage audits: Identified energy streams at SRWTP by functional systems. Accurate forecasting relies on multi-year trends of not only energy but also respective process variables (i.e. temperature, diversions, rainfall, and incoming flows).

Energy Optimization and Budget Forecasting last reported to Board in 2012. Savings at that time was \$400,000/year. Forecasted 20-year savings was \$11.3 million.

Energy-optimization improvements include: Energy-use monitoring, trending, and analysis; audits to identify energy-saving projects; BMPs developed for repair and replacement of inefficient equipment and systems; new control strategies and SOPs for energy-efficient operation under various seasonal/weather/ system maintenance conditions.

#### *Performance Measures & Results*

- Monthly/annual target, usage, and cost detail analysis Able to monitor fluctuations in energy usage. Any abnormal spikes researched and rectified.
- 5-year Energy Savings: Trends Anticipates \$400,000/year savings due to efficiencies.

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Capture nearly all biogas and recycle via a long-term commodities agreement with Sacramento Municipal Utilities District (SMUD) for use at Carson Ice-Gen Project. Buy back recycled energy as steam that is used instead of natural gas to heat digesters.

Fats, Oils & Gas (FOG) enhancement fed directly to digesters to increase biogas production.

Approximately 4 MW power-purchase agreement under negotiation with solar company that will cover 8% annual energy used and mitigates CEQA greenhouse gas emission for EchoWater treatment plant upgrade project.

Continued review of renewable-energy sources such as fuel cells, wind turbines, and green-energy vehicles.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Reduce greenhouse gas emissions at SRWTP</i>	Achieved. Only flare methane when SMUD is unable to accept it.
<i>Estimated annual Emissions reductions from biogas recycling</i>	VOCs: 18.5 tons/year; NOx: 16 tons/year; CO: 75 tons/year.
<i>Amount of power generated with recycled biogas</i>	Enough to power 5,800 households per year.
<i>Provide recycled methane as alternative energy source</i>	Recycled methane use significantly reduces overall emissions at Carson Ice-Gen Project and provides renewable, clean-energy to SMUD.
<i>Biogas Facility accepting FOG and other liquid food waste</i>	Regional San developed SOPs for accepting fats, oils, grease, and other liquid food waste for co-digestion and began accepting FOG waste in March 2016.

**WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

Regional San Water Asset Management Vision: Regional San will manage its water assets to sustain regional water supplies, benefit current and future ratepayers of the region, and safeguard and enhance the environment. In 2004 Regional San established goal to recycle up to 40 MGD in Sacramento Region over next 20 years.

Began recycling water onsite in 2003 utilizing 3.5 MGD water recycling facility in partnership with Sacramento County Water Agency (SCWA).

Recycled water used to irrigate parks, landscape medians, and school fields in Elk Grove. Water Recycling Opportunities Study completed in 2007.

Published Water Recycling 10-Year Update Report in 2014.

Currently upgrading treatment plant to full Title 22 equivalent effluent treatment mandated in NPDES permit. When “EchoWater Project” is completed in 2023, 181 MGD will be potentially available for recycling opportunities.

Currently building transmission pipeline to provide 1,000 acre-feet/year (AFY) recycled water (RW) for cooling purposes to cogeneration facility in South Sacramento in partnership with Sacramento Power Authority and City of Sacramento. Being built to configure service to future nearby RW users utilizing up to 1,700 AFY.

Currently planning for City of Elk Grove Phase II Expanded Irrigation project to provide up to 2,600 AFY RW to additional Elk Grove subdivisions.



South County Agriculture and Habitat Lands RW Project: Title XVI Feasibility study complete for future 52,000 AFY RW provided to agriculture and habitat lands currently using ground and surface water. Plans to provide RW to irrigate up to 18,000 acres of permanent ag and habitat mitigation lands in southern Sacramento County. Ten percent design and EIR/EIS development in progress.

Recycled Water Fill Station: Residential and commercial customers can fill their 300-gallon water containers with RW from our onsite fill station during dry season. Program participants are trained on RW permissible use.

Partnering with: Cities of Sacramento and Elk Grove, County of Sacramento, Sacramento County Water Agency, Sacramento Central Groundwater Authority, Regional Water Authority, Sacramento Power Authority, SMUD, Sacramento County Farm Bureau, Ducks Unlimited, The Nature Conservancy, Friends of Swainson's Hawk, Sierra Club, San Francisco Estuary Institute, State Department of Water Resources, State Water Resources Control Board, Central Valley Regional Water Quality Control Board, United States Bureau of Reclamation.

Helped to develop and participate in the integrated regional water management for Sacramento Region.

#### *Performance Measures & Results*

- Recycled water (RW) produced to date More than 3.4 billion gallons of RW produced since 2003
- Developed feasibility studies Identified RW opportunities for implementation.
- Developed hydrologic models Quantified potential benefits to groundwater and surface water supplies.
- Evaluation of environmental benefits Identified potential benefits to aquatic and terrestrial habitats.

#### **WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

**Additional Activity Descriptions (OPTIONAL)**

Regional San's (RS) vision speaks to environmental stewardship and regional sustainability with watershed stewardship as a subset of activities. Additionally, our mission speaks to addressing recovering resources, which will impact the entire watershed.

RS advocates for sensible policies, such as product stewardship to ensure pharmaceuticals and pesticides are disposed of properly, the promotion of water reuse projects, and the development of regional monitoring programs to develop better knowledge to protect our watershed.

RS participates in Delta Regional Monitoring Program with multiple dischargers participating in regional watershed monitoring through regulatory changes to permits.

<p>The Bufferlands, the 2,650 acres surrounding the RS treatment plant, includes 250 acres of restored riparian habitat, more than 35,000 established trees and shrubs, and managed wetlands for optimum bird feeding along the Pacific Flyway. It supports more than 230 species of birds; 25 species of native mammals; several native fish, amphibians, and reptiles; and more than 20 species of rare plants and animals, including several threatened and endangered species such as Swainson's hawk, vernal pool fairy shrimp, and giant garter snakes. In 2008 the Bufferlands received the Tree Hero award from the Sacramento Tree Foundation.</p>
<p>Over 300 acres of wetlands have been created and enhanced on the Bufferlands. Wetlands help trap watershed pollutants where complex processes metabolize nutrients and break down or store many harmful materials.</p>
<p>Over 200 acres of native grassland habitat with native perennial grasses and sedges and annual forbs have been restored on the Bufferlands. Deep-rooted perennial grass species promote water infiltration and slow runoff reducing erosion and transport of pollutants into surface waters of the watershed. Grasslands are important for nutrient cycling and carbon sequestration. Most terrestrial wildlife species within the watershed rely upon grassland habitat for a portion of their lifecycle.</p>
<p>Bufferlands staff dedicates hundreds of hours annually to control and eradicate noxious and invasive weeds from the watershed, which reduce biodiversity and displace wildlife. Regional San has partnered with the Stone Lakes National Wildlife Refuge since 1996 to control water hyacinth with the watershed.</p>
<p>Bufferlands staff promotes and provides regular naturalist-led tours of the watershed that emphasize the importance of responsible stewardship. For the past 21 years, Regional San has hosted the Walk on the Wildside event, a free public event celebrating conservation efforts throughout the Central Valley with open trails, entertainment, and informative exhibitors. More than 30 conservation-themed exhibitors help to convey the importance of environmental stewardship. Bufferlands outreach events typically draw well over 2,000 participants each year.</p>
<p>With the marked decline of Central Valley riparian forest acreage there has also been an unfortunate loss of suitable nesting habitat for obligate cavity nesting birds. In addition to Planting thousands of trees on the Bufferlands to provide future nesting habitat for cavity nesting species, staff and volunteers have built, installed, and maintained hundreds of artificial nest boxes for barn owls, kestrels, wood ducks, and numerous passerines. The use rate on nest boxes is well over 75%.</p>
<p>In conjunction with a private industry, RS recycles thirty percent of its biosolids into fertilized pellets, which decreases the amount of greenhouse gas emissions from exposed organic matter in landfills. Further, a market for sustainable fertilizer could bring down demand for phosphorous mining and synthetic fertilizer.</p>
<p>Multi-benefit recycled water project proactively manages groundwater while improving streamflow, enhancing groundwater-dependent habitats, sustaining prime agricultural land, and improving regional water-supply reliability. Tertiary recycled water will be supplied to irrigated agriculture in-lieu of farmers pumping groundwater, thereby raising the groundwater elevation, creating groundwater storage for ecosystem benefits and water-supply reliability.</p>
<p>Securing \$10 million of grant funding to develop the Sacramento River Watershed Program and providing on-going support to this Program.</p>
<p>Working with stakeholders to develop mercury control plans that include a phased approach to increase scientific knowledge and evaluate potential treatment options for various sources of mercury. Efforts also include supporting effective public outreach and exposure-reduction efforts.</p>
<p>Supporting product-stewardship efforts working with manufacturers to evaluate the entire lifecycle cost of their products and encouraging Pharmaceutical Take-Back Programs and a more robust multi-agency coordinated pesticide registration process. Helped develop and conduct pyrethroid fate and transport study in wastewater and participate in Pyrethroid Work Group.</p>
<p>Supporting additional research to understand the risk, fate transport, and potential environmental impacts of trace organics (e.g., pharmaceuticals, pesticides, endocrine disrupting compounds, personal care products, etc.).</p>
<p>Supporting efforts to ensure the sustainability (both ecosystem and water-supply reliability) of the Sacramento/San Joaquin Bay Delta.</p>
<p>Supporting and leading the development of collaborative regional monitoring programs among various stakeholders and developing water-quality report cards to help educate the public on the health of local waterways.</p>

Supporting efforts to ensure that sustainable groundwater management occurs through an in-lieu recharge program utilizing recycled water.
Supporting water conservation by working with local water interests and providing funding for the purchase of low-flush toilets.
Securing \$10 million of grant funding to develop the Sacramento River Watershed Program and providing on-going support to this Program.
Advocating for funding to support multi-benefit watershed projects, including water recycling.
Working collaboratively with the Central Valley Salinity Alternatives for Long-Term Sustainability initiative (CV-SALTS) to develop a salinity-management plan to address the Central Valley's rising salt levels that threaten agriculture and drinking water supplies. CV-SALTS participants are developing a workable, comprehensive plan to address salinity, including nitrates, throughout the region in a comprehensive, consistent, and sustainable manner.
Participating as a member of the Coalition to Support Delta Projects, a diverse group of stakeholders that identify near-term projects that would benefit the Delta water conveyance, water quality, flood protection, and agriculture.
RS admin building was LEED-certified at building completion and has green infrastructure that benefits the local watershed by capturing stormwater runoff.

### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Increase acres of riparian forest</i>	250 acres of riparian forest restored.
<i>Increase groundwater levels in South County</i>	25 feet increase of groundwater levels modeled.
<i>Decrease carbon footprint</i>	Solar panels to be installed in 2016.
<i>Participate in regional monitoring program</i>	Secured grant funding. Initial contributions in FY 14-15.
<i>Partnership with Regional Water Authority</i>	Fund ultra-low-flush toilet rebate program
<i>Partnership with CA Product Stewardship Council</i>	Provide funding for Don't Rush to Flush waste meds disposal education program and to place pharmaceutical collection bins throughout region.
<i>Partnership with BERG on Sacramento Area Sustainable Business certification program</i>	Provides education on reducing mercury from dental offices through Best Management Practices (BMPs) and "Sacramento Area Sustainable Business" (SASB) recognition to motivate dentists to install amalgam separators. 12 dentists certified to date.

## San Francisco Public Utilities Commission CA



WATER  
RESOURCES'S  
UTILITY OF THE  
FUTURE  
TODAY

### San Francisco Public Utilities Commission CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Community Partnering & Engagement

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Regional Water, Power and Sewer system with a Combined Sewer System		
Service Area (square miles): 468 square miles (50 square miles)	Average annual daily flow (MGD): 60 million gallons per day	
Population Served: 2.6 million water customers (800,000 wastewater customers)		
Location		
Street Address: 525 Golden Gate Avenue		
City: San Francisco	State: CA	Zip Code: 94102
Contact Information		
Name: Elinor Buchen	Phone: 415-551-4528	Email: ebuchen@sfgwater.org

## **NARRATIVE: Organizational Culture Activities**

### Commitment to Sustainability and Community Engagement

Our core mission at the SFPUC is to provide customers with high quality, efficient and reliable water, power, and wastewater services in a manner that values environmental and community interests and sustains the resources entrusted to our care. This mission statement embodies our belief that being a Utility of the Future means more than just delivering services. We believe that the "utility of the future" should represent the diverse and asset-rich communities and ratepayers that we serve and embrace a culture and practice of sustainability.

For example, SFPUC was the first utility in the country to pass an Environmental Justice Policy (2009) and a Community Benefits Policy (2010). These policies shape our approach to community engagement and project planning to be intentional about reaching out to and working on strategies that engage our all our constituents, particularly low-income, communities of color that are impacted by our operations. Another example is our Strategic Sustainability Plan that uses a triple-bottom line approach to long-term planning and performance monitoring. SFPUC also supports a number of innovative environmental programs such as resource recovery efforts, development of alternative water sources, and our recent launch of a green energy program (CleanPowerSF).

### Culture of Innovation

The SFPUC is an innovative utility that is constantly looking for opportunities to improve. Our approach is to test new ideas and make continuous improvements as we proceed. Some of the programs we have piloted in the last few years include:

- Green infrastructure projects – SFPUC is piloting 8 Green Infrastructure projects as part of Phase I of our multi-billion dollar Sewer System Improvement Program (SSIP). In total, the SFPUC has supported 282 green infrastructure projects that are planned or in progress on private and public properties.
- Beneficial biosolids reuse – In 2015, SFPUC's Biosolids Management System (BMS) achieved Gold Level recognition from the National Biosolids Partnership. As a part of its commitment to continual improvement, the Biosolids Program is pursuing the production of pathogen-free, Class A biosolids through four avenues: participating in a pilot project to hydrolyze biosolids with Fairfield Suisun Sewer District, implementing temperature phased anaerobic digestion at the City's Oceanside Plant, creating compost blenders for the Agency, and sharing best practices through regional coalitions.
- On-site re-use initiatives – SFPUC has developed a Non-Potable Water program and city wide ordinance to encourage treatment of water onsite to reduce use of potable water for toilet flushing and irrigation in new buildings and reduce stormwater flows. Our headquarters uses a variety of cutting-edge water re-use technologies, including an on-site wastewater treatment system and rainwater catchment system for toilet use.
- Community Benefits in Contracts –SFPUC has embedded community benefits requirements into professional service RFPs over \$5 million. To date, there are 47 professional services contracts across the Agency that leverage more than \$7 million in direct financial contributions and

volunteer hours to local schools and nonprofits. In addition, we have started including community benefits in alternative delivery contracts, the first of which leverages over \$4.5 million. One Water Approach

Another unique aspect of our agency is that we are a water, power and sewer utility, which brings its challenges, but also presents opportunities for alignment. As we test new approaches for conservation and reuse, we need to consider the implications for the other aspects of our system.

Our systems are interconnected and we are working to embody a “one water” system that considers all sources of water within the urban water cycle as a potential resource, implementing the latest technologies in water treatment, and applying the right water to the right use.

Our goal is to provide a more resilient water supply in the face of climate uncertainties and potential disruptions such as earthquakes, and create synergistic projects that provide multiple benefits.

#### Internal Workforce Development

Lastly, an area in which we have excelled is in strengthening our internal workforce development approach. We have a team dedicated to Enterprise Workforce Planning that has been working closely with workgroups across the agency to develop and implement a competency-based framework. Each job description will ultimately be tied to a set of behavioral, technical and leadership competencies. This approach will provide a baseline for creating job descriptions, recruiting and interviewing candidates and assessing training needs. The EWP have also developed a set of web-based tools so that employees can easily locate resources to strengthen specific competencies and identify potential career pathways.

We have created a cross-enterprise working group to support the implementation of the competency model and associated training and leadership development programs.

#### Community Partnering and Engagement Activities

The SFPUC is committed to building long-term relationships with our stakeholders and community members. Values around “being a good neighbor” and community benefits have been integrated throughout all levels of the Agency – from our mission and governing policies (noted earlier) to how we conduct our business regarding budget decisions, land use, and community investments. Executive leadership, staff, and external stakeholders all play a role in shaping and refining our approach to community partnering and engagement, which spans the International Association of Public Participation’s Spectrum of Public Participation: from informing, to consulting, to involving, to collaborating, and finally to empowering. These are some of SFPUC’s activities in the Community Partnering and Engagement area:

##### Inform: Cutting Edge Public Education

The SFPUC has a pro-active, engaging, multi-media approach to keeping the public informed about our work. We look for unconventional ways to engage the public and to make our invisible systems visible. For example, to get people on board with 10% water conservation goals, we launched a public education campaign to show that water conservation is smart and sexy, with taglines like “When showering, make it a quickie.” We also enlisted the help of some of our summer interns to help us create a rap about our sewer system, which has over 25,000 views on YouTube.

##### Consult: Equitable Engagement Guidelines

The SFPUC believes that project managers and communication staff are in the unique position of interfacing with our customers and the community in a variety of important ways. As the SFPUC makes critical investments in our infrastructure through our Sewer System Improvement Program, we developed Equitable Engagement Guidelines, which are designed to ensure meaningful engagement that is reflective of our diverse communities, through planning, design and construction of proposed Sewer System Improvement Program projects.

The goals of these guidelines are to:

- Help standardize the way we do business (yet allow for flexibility to adapt) to ensure delivery, implementation, and course correction for successful and equitable public engagement
- Identify and document best practices for meaningful public engagement outreach and communications strategies
- Achieve diverse and meaningful stakeholder engagement of the representative San Francisco demographic

Inform, Consult, Involve, and Collaborate: Southeast Community Outreach and Engagement Process

SFPUC has utilized multiple engagement strategies in the community most impacted by the agency's sewer services, Bayview Hunters Point. To mitigate the adverse environmental and social impacts of the expansion of the Southeast Water Pollution Control Plant during the 1970s and 1980s, the Southeast Community Facility (SECF) and Greenhouses (GH) were constructed as part of an agreement between the City and County of San Francisco and residents of Bayview Hunters Point. The Southeast Community Outreach and Engagement Process invites the community to inform the future of the Southeast Community Facility and Greenhouses to ensure that the facilities and the programming housed inside are making an even greater impact in addressing the employment and educational needs of the community. Our outreach includes:

#### Grassroots Outreach

We will be doing door-to-door knocking, tabling at community events, organizing our own community events to share information, and presenting at key community meetings.

#### Community Partnerships

We provided mini-grants to over 16 Bayview groups in the Bayview including seniors, health organizations, youth, and faith-based organizations, such as Bayview YMCA, Community Youth Center, Rafiki Wellness, and Young Community Developers, to conduct focus groups and to host an interactive Youth Summit.

#### A Community Team of diverse leaders

Our team includes members of the Southeast Community Facility Commission, Southeast Working Group, Tenants of the SECF, members of the SFPUC's Citizen Advisory Committee and other community stakeholders to provide overall guidance for the Southeast Outreach and Engagement Process.

Collaborate: Engagement of the SFPUC Citizen Advisory Committee (CAC)

The CAC has been an effective and engaged body that is truly representative of the agency's various stakeholders that can provide feedback and recommendations on the agencies long-term infrastructure, financial and strategic planning. The agency relies on the CAC to deliberate on priorities of the agency in a timely manner as well as to raise topics of concern and interest to low-income ratepayers, renters, small businesses, families, immigrants and other communities most impacted by the agency's services.



Over the past few years, membership of the CAC has improved to truly represent the diversity and interests of the city's ratepayers and increased its productivity and engagement with agency staff and the public.

Collaborate: College Hill Learning Garden

SFPUC partnered closely with the local public school district (SFUSD) to build the College Hill Learning Garden, an educational site with dozens of interactive features to educate elementary students about the sustainability of water, food, energy, and waste systems with the goal of developing the next generation of environmental stewards. Each feature in the garden (solar panels, a composting toilet, rain gardens, a pond, vegetable planters, a green roof and more) was designed with a specific curriculum that is tied to the common core standards and STEM. Nearby neighborhood groups were proactively included early and often in the planning and designing of the garden.

Empower: Crocker Amazon Sharing Farm

To develop one of the Urban Ag pilot sites, the SFPUC partnered with the San Francisco Foundation and a local nonprofit, PODER (People Organizing to Demand Environmental and Economic Rights) to develop an urban sharing farm in San Francisco's ethnically diverse Excelsior neighborhood. For this project, SFPUC empowered PODER to manage all aspects of community engagement for the development of a sharing farm. Over a period of about 3 years, PODER did multi-language surveys, door knocking, youth training days and hosted several community meetings. The SFPUC provided staff support, use of the land for no-fee and funds to build the farm's infrastructure.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Performance Measures & Results:

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Number of years that the agency has received an award for including sustainability metrics in the agency's financial planning	The Government Finance Officers Association has awarded the SFPUC the Achievement for Excellence in Financial Reporting for its Comprehensive Annual Financial Reports for the seventh consecutive year.
Number of workgroups with competency models in place	7, with 10 in development
Number of professional contracts that include community benefit commitments and amount of dollars leveraged in financial contributions and volunteer hours	47 professional services contracts across the Agency that leverage close to \$7 million in direct financial contributions and volunteer hours to local schools and nonprofits.
Number of alternative delivery contracts that include community benefit commitments and amount of dollars leveraged in direct financial contributions, volunteer hours, and trainee hours	One alternative delivery contract that leverages \$4.5 million in direct financial contributions, volunteer hours, and trainee hours
Number of green infrastructure projects	282 (240 projects that comply with the Stormwater Management Ordinance, 32 projects funded by the Watershed Stewardship Grant, 8 Early Implementation Projects, 2 interdepartmental projects)
Number of non-potable projects in progress and planned: <ul style="list-style-type: none"> <li>• Number of developments in San Francisco that are currently operating or are in the process of installing a non-potable water</li> <li>• Number of planned non-potable water projects</li> </ul>	<ul style="list-style-type: none"> <li>• 15 developments in San Francisco that are currently operating or are in the process of installing a non-potable water</li> <li>• 19 planned non-potable water projects</li> </ul>

## COMMUNITY PARTNERING & ENGAGEMENT

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement
- See list in Narrative
  - Developed cutting edge public education campaign and created equitable engagement guidelines for project managers
  - Invested in a deep and meaningful Southeast Community Outreach and Engagement Process

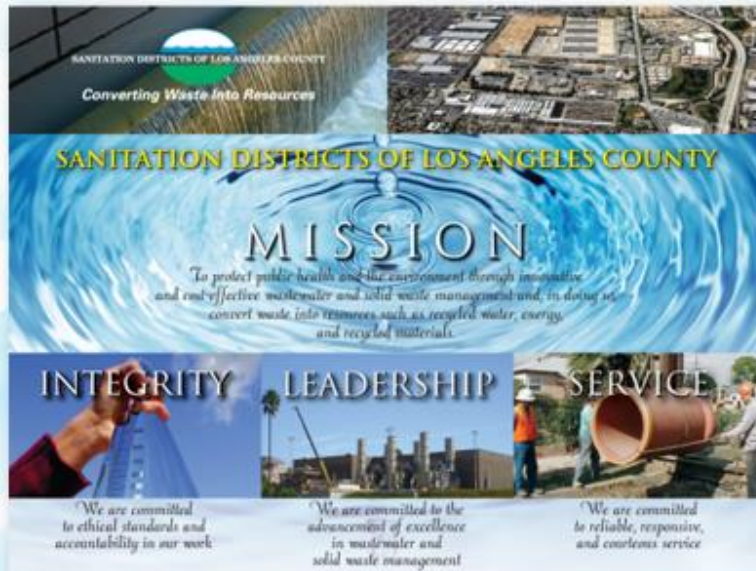
- Enhanced the SFPUC Citizen Advisory Committee (CAC)
- Collaborated with the local school district (SFUSD) to build the College Hill Learning Garden
- Empowered a community organization to plan, design and engage diverse communities for the Crocker Amazon Sharing Farm

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Number of digital subscribers to outreach newsletters	61,188
Number of social media followers	5,569 Facebook followers, 13,106 Twitter followers
Number of posts read by social media followers per year	519,058 Facebook posts
Percentage of Sewer System Improvement projects that include early stakeholder engagement resulting in stakeholder input at the design and initial planning stages	100% (42 construction projects)
<p>Targeted outreach and engagement in Bayview Hunters Point, the neighborhood most impacted by our sewer services, to inform the future of the Southeast Community Facility and Greenhouses</p> <ul style="list-style-type: none"> <li>• Number of doors knocked</li> <li>• Number of community presentations</li> <li>• Number large community events attended and number of people reached</li> <li>• Number of focus groups conducted and number of residents who participate</li> </ul>	<p>Target goals for 2016</p> <ul style="list-style-type: none"> <li>• 2500 households that had their doors knocked</li> <li>• 22 community presentations conducted</li> <li>• 10 large community events reaching over 650 people</li> <li>• 12 focus groups reaching over 144 residents</li> </ul>
Number of meetings held by the Citizen Advisory Committee (CAC)	25 meetings were held in FY15-16, an increase of 10 meetings (67% increase)
Increased number of people who attend the Citizen Advisory Committee meetings	192 people attended CAC meetings in FY15-16, an increase of 53 people compared to previous fiscal year (38% increase)

Number of resolutions passed by the Citizen Advisory Committee per year	5 in FY15-16, 2 in FY14-15
Number of secondary land use projects that meet community needs and were developed with external partners	2 (College Hill Learning Garden and Crocker Amazon Sharing Farm)
Robust and inclusive community engagement led by a community partner to develop an urban agriculture pilot	Over a period of about 3 years, the community organizing organization, PODER, did multi-language surveys, door knocking, youth training days and hosted several community meetings to engage the diverse southeast community in planning and designing the Crocker Amazon sharing farm. The robust engagement process overcame potential opposition and developed a broad set of supporters, including neighboring residents, youth and senior organizations, park advocates, conservationists, and local elected officials. SFPUC and PODER developed a Principles of Collaboration document to codify the partnership. The SFPUC provided staff support, use of the land for no-fee and funds to build the farm's infrastructure.

## Sanitation Districts of Los Angeles County CA



### Sanitation Districts of Los Angeles CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Water Reuse

<b>Utility Description</b> (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): 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 (MGD): 400	
Population Served: 5.6 million		
<b>Location</b>		
Street Address: 1955 Workman Mill Rd		
City: Whittier	State: CA	Zip Code: 90601
<b>Contact Information</b>		
Name: Susan Hsu	Phone: 562-908-4288 x2302	Email: shsu@lacsds.org

**NARRATIVE:** The mission of the Sanitation Districts of Los Angeles County (Districts) is to 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 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 provides about one-fourth of Los Angeles County's solid waste management needs.

Seventeen of the Districts in the metropolitan Los Angeles area are served by a regional, interconnected system of facilities known as the Joint Outfall System (JOS). The six upstream water reclamation plants (WRPs) produce disinfected tertiary recycled water. Downstream, the Joint Water Pollution Control Plant (JWPCP) treats two-thirds of the wastewater in the JOS along with the solids removed at the upstream plants.

Separate from the JOS, regional wastewater systems are managed by the Districts 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 Districts is 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 suggestion box is also available to all employees. Management reviews and responds to each suggestion and comment. Improvements to the agency, as a result of suggestion box comments, include installation of a drought-tolerant landscaping, and replacement of bottled drinking water coolers with more sustainable filtered water stations throughout the administration office.

To continually improve agency performance, every department and section set annual goals. Status updates for each goal are posted and available to each employee. A new employee performance review

system is currently being pilot tested. The system focuses on continual improvement by identifying goals and career development opportunities for employees and includes an employee input section. Additionally, a formal management /supervisor training program was established to ensure Districts leadership maintains the skills needed to be as effective as possible.

The agency aims to be transparent and keep employees engaged through presentations and widely distributed publications. Monthly staff presentations and lunchtime talks are held on various topics such as updates on on-going projects, future outlooks of various facilities and overviews of different sections' roles in the agency. The presentations are broadcasted to remote facilities to allow off-site employee participation.

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 Districts and the "Pipeline", a bimonthly newsletter, celebrating personal and professional accomplishments. The Pipeline also includes an article written by management addressing agency developments and acknowledges employees through the Excelsior employee excellence recognition 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 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 Toastmasters 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 asset management system has been implemented at each treatment plant that allows staff to proactively plan for equipment maintenance and infrastructure improvements, and more accurately track equipment life-cycle costs. A group of wastewater research engineers and support staff continually develop new ways to optimize existing processes and identify new technologies to facilitate permit-compliant, and cost-effective wastewater management. Examples include developing sequential chlorination for tertiary recycled water disinfection, and testing the feasibility of a food waste co-digestion at the JWPCP.

#### Beneficial Biosolids Reuse

The 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 Districts are continuing to evaluate innovative management options such as biosolids-to-fuel facilities. The 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 Districts.

#### Community Partnering & Engagement

The Districts sponsor many educational opportunities including our marine biology harbor tours and inclass microorganism and water quality science labs. We are committed to promoting and practicing environmental sustainability through our community partnering and engagement programs. The Districts actively collaborates with community-based organizations including nonprofit groups, professional associations, educational institutions and other public agencies. The Districts 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. For the last 10 years, the Districts have also hosted an annual Earth Day celebration at our office in Whittier that draws anywhere from 1,500 to 3,000 visitors. The family-friendly fair is a great opportunity for the local community to learn more about the Districts and environmentally sustainable practices through tours of Districts' facilities, and over 50 exhibitor booths.

#### Energy Efficiency

The 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. Energy efficiency measures from the program accounted for \$5.7 million in savings for the 2014-2015 fiscal year.

The Districts are also committed to reducing fossil fuel usage and promoting alternative fuel vehicles. Approximately 415 employees participate in a rideshare program that provides incentives to encourage carpooling, riding bikes and driving alternative fuel vehicles. Currently, the Districts have 48 natural gas and 6 electric vehicles in the fleet and are continuing to expand our alternative fuel fleet vehicles. Natural gas fueling stations are also located at three Districts facilities that are open for public use.

#### Energy Generation & Recovery

The JWPCP operates a combined cycle combustion turbine facility that generates approximately 20MW of electricity for on-site use and steam for the plant's anaerobic digesters, making the JWPCP virtually energy and heat self-sufficient. The facility uses three digester gas fired turbines and one steam turbine to produce green energy. During periods of low plant power demand, excess power is exported to the power grid. When the steam system is not operational, digester heating steam is provided by means of four digester gas-fired boilers.

The Districts and USA Waste Inc. entered into an agreement to inject up to 61 tons per day of processed recycled food waste into an existing digester at the JWPCP. This system was placed into service in early 2014. The addition of food waste has resulted in an increase of digester gas production and has generated 250 kW of electricity from the additional digester biogas produced.

#### Water Reuse

The Districts are one of the top producers of recycled water in the nation and remain strong proponents of expanding reuse options for reducing reliance on imported water. Over 100,000 acre-feet of tertiary treated recycled water produced by the WRPs is typically used at more than 800 sites throughout LA County each year. More than half of the recycled water used goes to recharging the local groundwater supply. The remaining is distributed to non-potable reuse sites. The WRPs also utilize recycled water for on-site irrigation, wash-down, pump cooling, chemical mixing, and toilet flushing.



The Groundwater Reliability Improvement Program, in partnership with the Water Replenishment District of Southern California, will take up to an additional 21,000 AFY of recycled water from three of the Districts' WRPs for groundwater recharge. A portion of the recycled water will be further treated at an Advanced Water Treatment Facility (AWTF) for groundwater recharge.

The Districts have partnered with the Metropolitan Water District of Southern California in a Regional Recycled Water Supply Program that would take secondary effluent from JWPCP and purify it at an AWTF for groundwater recharge. A 1 MGD demonstration plant located at JWPCP, and the preparation of feasibility studies have been approved as the first phase of the project. Additional potential phases can produce up to 150 MGD of recycled water for groundwater replenishment which would make the potential full-scale project the nation's largest recycled water supply program.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

A suggestion box is available to each employee to present concerns or suggestions for the agency. Management reviews and provides an individual response to each comment received.

To continually improve agency performance, every department and section set annual goals. Status updates for each goal are posted and available to each employee.

A new employee performance review system is currently being pilot tested where the ratings categories align with agency core values. The system focuses on continual improvement by identifying goals and career development opportunities for employees and includes a self-evaluation section.

An asset management system is in use at the treatment plant facilities to allow staff to proactively and efficiently maintain plant assets. The system allows the Districts to consider life-cycle costs and move away from a largely reactive and project-based way of conducting operations and maintenance.

The "Pipeline", an employee newsletter, informs new employees, current employees and retirees of the activities of the organization. It celebrates personal as well as professional accomplishments. The Pipeline also includes an article written by management addressing agency developments and acknowledges employees through the Excelsior employee excellence recognition program.

Monthly staff presentations and lunchtime talks are held on various topics such as updates on on-going projects, future outlooks of various facilities and overviews of different sections' roles in the agency. The presentations are broadcasted to remote facilities to allow off-site employee participation.

*Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Employee suggestion box	711 suggestions have been received since December 2010 (about 130 per year). Roughly 40% of the suggestions have led to a change being implemented.
Current events and lunchtime presentations	In 2015, 16 presentations were made by staff. Each presentation was broadcasted to up to 7 remote facilities. The presentations are also recorded and available to employees in the Districts' technical library for individual viewing.
Workforce Survey , typically conducted every 2 years	<ul style="list-style-type: none"> <li>- 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 Districts meeting.</li> <li>- A training program is provided for all managers and supervisors. New supervisors receive training after promotion.</li> <li>- An employee liaison position was established to advocate for employees. Liaison works directly with the Assistant Chief Engineer to ensure concerns are resolved.</li> <li>- Tours of Districts' facilities are available to all employees to maintain employee engagement.</li> </ul>
Asset management program	<ul style="list-style-type: none"> <li>- Since September 2014, a vibration monitoring/condition assessment program has been pilot tested on critical mechanical equipment at multiple WRPs. The condition assessment program has allowed early detection of developing problems, which can be monitored over time and scheduled for repair when appropriate.</li> <li>- Equipment information is directly linked to each asset to save staff time by making essential data easily accessible.</li> </ul>

**BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

The Districts have developed two composting facilities that can be expanded to process the full amount of biosolids that the Districts generate.

The Districts' biosolids management strategy allots a small percentage of its biosolids capacity for the development of new and emerging technologies. The Districts currently have one contract for the development of a biosolids-to-fuel facility.

The Districts continually evaluate dewatering equipment for operational efficiencies and to minimize the volume of biosolids hauled offsite. The Districts are pilot testing a biosolids dryer that can increase the biosolids total solids content to approximately 90%.

The Districts have one hauling contract that utilizes natural gas-fueled vehicles for a portion of its contracted hauling. Hauling with natural-gas vehicles provides air quality benefits, such as reduced air and greenhouse gas emissions compared to hauling with diesel-fueled vehicles.

The Districts are dedicated to develop expertise in all aspects related to biosolids. Districts staff responsibilities include; biosolids operations, biosolids contract management; facility planning and permitting (including air quality and water quality), regulatory reporting, monitoring regulatory issues, and new technology evaluation.

#### *Performance Measures & Results*

- Beneficially used biosolids in 2015: 85% of the over 440,000 wet tons produced was beneficially reused (75% composted and 10% land applied)
- \*Please note that the Districts are in the process of developing performance measures for its biosolids management program.

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

The Sanitation Districts invested \$2.3 million to restore the Bixby Marshland, a 17-acre marsh, located to the northwest of our largest treatment facility, Joint Water Pollution Control Plant (JWPCP). The Sanitation Districts owned-and-operated marshland is open the first Saturday of the month with docents available onsite to provide tours. Tours are also scheduled by appointment for groups, including agencies, associations, and businesses.

The JWPCP Citizens' Advisory Committee (CAC) was formed in 1978 to provide a forum for community input regarding the Sanitation Districts' operations and to help guide the Sanitation Districts in its efforts to be a better neighbor to the surrounding community. The CAC members also act as a conduit to

disseminate information from the Sanitation Districts to the organizations and neighborhoods they represent. The CAC meets quarterly and is responsible for many of the improvements associated with the JWPCP, including odor reductions and perimeter landscaping.

In partnership with LA County, the Sanitation Districts hold Household Hazardous Waste and Electronic Waste Collection Program (HHW) gives Los Angeles County residents a legal and cost-free way to dispose of unwanted household chemicals that cannot be disposed of in the regular trash. The program also helps to prevent disposal of hazardous materials down household drains.

The Sanitation Districts have hosted an Earth Day celebration for the past 10 years. Each year, anywhere from 1,500 to 3,000 attendees and around 50 exhibitors from the local community come to the Sanitation Districts' administrative office to learn and share information about the Sanitation Districts and environmentally sustainable practices.

A partnership with the South Bay Environmental Services Center, under the South Bay Council of Governments (SBCOG), serves as a central clearinghouse for energy efficiency and water conservation resources, by providing information and solutions to businesses, residents and governments. Partners include Los Angeles County Metropolitan Transportation Authority (Metro), City of Torrance, SoCal Gas, Southern California Edison, West Basin Municipal Water District, Los Angeles Department of Water and Power.

The Sewer Science program, established in 2003 by the Sanitation Districts and currently in partnership with the Youth Science Center, provides students with a real-life application of science as they make, clean, and test wastewater. Sewer Science is a 3-4 day wastewater treatment laboratory for high school students. All materials for the lab are provided by the Sanitation Districts and facilitators are provided through a partnership between the Sanitation Districts and the Youth Science Center.

This World Water College Grant Program is a program that provides grants for college students to research, develop, and communicate water conservation technology that can be employed cost-effectively in water-stressed regions such as Southern California. Partners in the program include The Metropolitan Water District of Southern California and the United States, Department of the Interior, and the Bureau of Reclamation.

The Districts is a sponsor of the Environmental Engineers of the Future (E2F) scholarship program which offers funding for students attending one of many outstanding Environmental Engineering Masters programs across the nation, in return for a two-year employment commitment. Sponsored by public agencies and private engineering firms, the program aims to further prepare students who have a broad interest in various environmental engineering fields, such as municipal water, wastewater, solid waste, air quality, water resources, hazardous waste, sustainable engineering and energy recovery. Since the start of the program in 2005, approximately \$1.1 Million has been provided to students obtaining a Masters Degree in Environmental Engineering.

Think Watershed is a collaborative partnership that focuses on: funding field trips for elementary students in Los Angeles County on board a Floating Laboratory in Long Beach and Los Angeles Harbors; providing pre- and post-trip curriculum to maximize students' Floating Lab experience; and establishing a website where students can post and compare results of data collected from on-board experiments. Our Partners include agencies, educators, and businesses such as the Port of Los Angeles, Central Basin

Water District, Water Replenishment District, Los Angeles County Office of Education, and the USC Sea Grant Program.

*Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Household hazardous waste collection events	In 2015, over 42,000 households were served. Items collected included almost 170,000 gallons of paint, 3,026 drums of miscellaneous waste and 3,769 car batteries.
Earth Day celebration	Each year anywhere from 1,500 to 3,000 visitors attend the Earth Day celebration and 150 employees volunteer to make the event possible.

Tours of Sanitation Districts Facilities	More than 150 educational tours of Sanitation Districts’ facilities are conducted with more than 5,000 attendees each year.
Educational programs	<ul style="list-style-type: none"> <li>- Since 2004, the College Grant Program has disbursed over \$400,000 in grant funding to forty community college and university teams representing the counties of Los Angeles, Riverside, Orange, San Bernardino, Ventura and San Diego.</li> <li>- More than 40 schools participate annually in the Sanitation Districts’ week-long, water quality laboratory reaching more than 6,000 students annually.</li> <li>- More than 50 educational harbor tours as part of the Marine Biology Floating Laboratory are conducted each year reaching more than 2,500 community stakeholders annually.</li> </ul>
Social Media	Through 1 Facebook site, 9 yelp sites, and 28 google my business sites the Sanitation Districts reach more than 1,000 community stakeholders monthly.
Information Line	Through our information line, the Sanitation Districts provides timely, courteous, and accurate responses to more than 1,300 interested community stakeholders each year.
Community Partner Awards	Since 1975 the Sanitation Districts has received more than 214 awards from community-based organizations including nonprofit groups, professional associations, educational institutions and public agencies on both wastewater and solid waste projects.

**ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff

- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Formal Energy Efficiency Management Program led by a dedicated project engineer. Life cycle cost analyses, including cost of energy, are performed during each project design period.

Maintenance shop and outside lighting at the Joint Water Pollution Control Plant (JWPCP) are replaced with LED lighting as existing lights fail. This greatly reduces lighting power consumption and increases bulb life.

The Sanitation Districts have 48 natural gas and 6 electric vehicles in the fleet and is continuing to expand our alternative fuel fleet vehicles.

Approximately 415 employees participate in a rideshare program that provides incentives to encourage carpooling, riding bikes and driving alternative fuel vehicles.

Staff optimizes treatment plant operations to increase energy efficiency. For example at the treatment plants, low-efficiency recessed impeller-style sludge pumps were replaced with higher efficiency screw-centrifugal type pumps, biological reactors are taken out of service during low flows to reduce power consumption of mixers, inlet works influent sewer levels and sedimentation tank effluent channel levels are maintained as high as possible to maximize the suction head, and biotrickling scrubbers for primary sedimentation tanks are run on low speeds to minimize energy consumption while still containing odors.

#### *Performance Measures & Results*

- Cumulative system load reduction: 4.8 MW since program initiation in 2006
- Annual Energy Efficiency Management Program Savings: \$5.7 million during FY 2014-2015
- Cumulative Energy Efficiency Management Program Savings: \$34 million since program initiation in 2006

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

The Joint Water Pollution Control Plant 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. Natural gas is used to supplement digester gas to achieve necessary turbine generator output levels. Generator outputs are maintained to ensure that no power is imported from the electrical utility, while minimizing the amount of natural gas which must be consumed.

The Districts, in partnership with USA Waste of California, Inc., have developed a food waste recycling project in which source separated food waste is collected, processed, and delivered to an existing anaerobic digester at the JWPCP. The addition of food waste has resulted in an increase of digester gas production and has generated an additional 250 kW 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.

Staff training teaches how electrical energy costs change during the day and week, and shutdowns of power plant equipment are scheduled to minimize loss of energy production during high-rate periods.

#### *Performance Measures & Results*

- Power generated from digester gas and used on-site at JWPCP: Average 16.8 MW for FY 2014-2015
- Electricity purchases avoided by generating power on-site: \$18.2 million for FY 2014-2015

#### **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

For over 50 years, recycled water produced by the Districts is reused off-site for a wide range of applications including urban irrigation, agricultural irrigation, cooling towers, industrial processes (carpet dyeing, metal finishing), environmental enhancement and construction applications (dust control, soil compaction, concrete mixing).

A flow equalization tank will be constructed 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 boost production during the high demand periods.

The Districts is partnering on a 1 MGD demonstration plant at our largest treatment plant, the Joint Water Pollution Control Plant, with the Metropolitan Water District of Southern California, with a feasibility study underway for a project to recycle up to 150 MGD for groundwater replenishment.

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 Districts have provided engineering reports to the local regulatory authorities for expanded distribution systems and supported legislation promoting water recycling (e.g., approval of recycled water hose bibs at cemeteries).

#### *Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Increase in recycled water used from base year FY 1994-1995 through FY 2014-2015	<ul style="list-style-type: none"> <li>- Number of reuse sites increased by 144% (324 to 791)</li> <li>- Volume of recycled water used increased by 65% (53,890 to 88,895 acre-feet per year)</li> <li>- Percent of available recycled water beneficially reuse increased from 25.4% to 55.2%</li> <li>- Acreage irrigated with recycled water increased by 109% (from 7,873 to 16,433 acres)</li> </ul>

Environmental Benefits for FY 2014-2015	<ul style="list-style-type: none"> <li>- Avoided energy usage of 267 million Kwh (3,000 kWh/AF for pumping imported water over Tehachapi Mtns)</li> <li>- Avoided greenhouse gas production of approximately 200,000 tons of carbon dioxide</li> <li>- Avoided air pollutant production of 153.5 tons of nitrogen oxide, 26.7 tons of carbon monoxide, 16.0 tons of sulfur oxides, 5.3 tons of particulates, and 1.3 tons of reactive organic gases</li> </ul>
Water supply benefits	<ul style="list-style-type: none"> <li>- Augmentation of supply with recycled water equivalent to the needs of 445,000 people (city the size of Mesa, AZ, the 38<sup>th</sup> largest city in U.S.)</li> <li>- Imported water for seawater intrusion barrier replaced with advanced treated recycled water (moving to 100% recycled)</li> <li>- Local potable water for oil-zone repressurization replaced with recycled water</li> <li>- 50,000 to 60,000 acre-feet per year of imported water for groundwater recharge replaced with recycled water, starting in 1962</li> </ul>



## *Santa Rosa Water CA*



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### **Santa Rosa Water CA**

#### **Utility of the Future Today Activity Areas Meeting Criteria for Recognition:**

- ★ **Organizational Culture**
- ★ **Beneficial Biosolids Reuse**
- ★ **Community Partnering & Engagement**
- ★ **Energy Efficiency**
- ★ **Energy Generation & Recovery**
- ★ **Nutrients**
- ★ **Water Reuse**
- ★ **Watershed Stewardship**

<b>Santa Rosa Water System Description</b>		
Santa Rosa Water operates a water distribution, sewer collection, storm water management, and regional water reuse system		
Service Area: 64 square miles	Average annual daily flow: 17 MGD	
Population Served: 230,000		
<b>Location</b>		
Street Address: 4300 Llano Road		
City: Santa Rosa	State: CA	Zip Code: 95407
<b>Contact Information</b>		
Name: Rita Miller	Phone: 707.543.3879	Email: <a href="mailto:rmiller@srcity.org">rmiller@srcity.org</a>

**NARRATIVE:** Santa Rosa Water is a dynamic and innovative team of professionals, working 24 hours a day, 7 days a week to sustainably provide safe and reliable water supply, wastewater collection, water recycling and reuse, and storm water management for our community.

Our mission is to protect public health by sustaining water resources, infrastructure, and the environment. As our mission indicates, we are committed to achieving social, environmental, and fiscal objectives in a sustainable and balanced manner so that one goal is not benefitted while other(s) are compromised.

Santa Rosa Water accomplishes this by operating a water distribution and sewer collection system for the Santa Rosa community. This includes 54,000 residential and business accounts. Santa Rosa Water also has a robust environmental education program, which includes water-use efficiency, pollution prevention, drinking water quality, and creek stewardship.

In addition, Santa Rosa Water operates a Regional Water Reuse System which serves approximately 230,000 residents in Santa Rosa, Rohnert Park, Cotati, Sebastopol, and unincorporated portions of Sonoma County. The hub of the Regional Water Reuse System is the Laguna Treatment Plant, which recycles wastewater from homes and businesses throughout the region.

The Laguna Treatment Plant recycles approximately 7 billion gallons of wastewater each year. During dry to normal water years, nearly 100% of the tertiary treated recycled water is beneficially reused. Santa Rosa’s advanced treated recycled water is produced in compliance with all applicable federal, state and local regulations, safeguarding public health and protecting the Laguna de Santa Rosa watershed.

The recycled water produced at the Laguna Treatment Plant is a valuable resource for urban and agricultural irrigation, as well as recharging geothermal steamfields to produce clean energy. Recycled water is delivered to customers via Santa Rosa’s Recycled Water Distribution System which includes a 41-mile long pipeline to recharge Calpine’s geothermal Geysers Steamfields to produce energy for the region.

Santa Rosa Water’s Biosolids Distribution System reuses nearly 26 thousand tons of biosolids annually. Santa Rosa Water’s biosolids are beneficially reused through land application to increase crop yields and composted for use in landscapes and gardens to enhance soil with nutrients, such as nitrogen and phosphorus.

Additional watershed management responsibilities include enhancing nearly 100 miles of creeks through restoration and community stewardship, providing biological and engineering services, and managing storm water to preserve and restore water quality and minimize flooding. Civil engineers, engineering technicians, biologists, and support staff work with other agencies and City departments to implement our Storm Water Management Plan and Citywide Creek Master Plan. Funded by a parcel assessment, grants, and the City's General Fund, Santa Rosa Water works to improve storm water quality, enhance creeks, and maintain compliance with National Pollutant Discharge Elimination System Storm Water permit requirements. Staff also responds to citizen concerns about drainage and waterways.

Along each step of the process, Santa Rosa Water seeks to engage staff, the community, elected officials, and stakeholders. Santa Rosa Water has a long history of engaging employees in the design and implementation of continuous improvement efforts. At key junctures in the past 15 years, Santa Rosa Water has utilized an internal Steering Team to review organizational structure and operations with an eye to improving efficiency, resiliency, and cost-effectiveness. In Fiscal Year 2010-2011, the Steering Team analyzed all department functions (as core or marginal) and identified improvement processes. The Team identified 182 core functions and 112 "marginal" ones (marginal functions were rated as "continue," "discontinue," or "analyze further" and acted upon accordingly). Additional input was solicited from all Santa Rosa Water staff, resulting in 72 new ideas for cost savings and efficiency improvements: 19 were immediately implemented, 27 were recommended for implementation in coordination with other departments or entities, 10 required further input from other departments or entities, and 10 were not recommended for further action. The Steering Team also updated our mission statement to reflect the fact that we are, first and foremost, a comprehensive water resource utility (water, wastewater and recycled water) that proactively protects public health and sustains water and wastewater resources, infrastructure and the environment.

Our mission centers on our core functions, which are providing safe, reliable drinking water and collecting and processing wastewater in a manner that enhances public health, the environment, and the economy (including our fiscal solvency). Rather than seeing these as competing interests, we recognize them as interdependent and integral to our success. Therefore, we balance the costs and benefits of our activities in terms of short- and long-range economic, social, and environmental outcomes.

Our social objective is to protect public health. To achieve this, we fund and staff activities that ensure water quality. Our efforts include continuous water testing, water line flushing, backflow and cross connection control enforcement, reservoir maintenance, and stabilization of water pressure to ensure adequate flow in case of fire. We conduct these activities cost-effectively and in ways that protect public health and the environment.

Our environmental objective is to sustain the natural resources in our watershed. Our Energy & Sustainability Team works to ensure that Santa Rosa Water optimizes energy use and reduces greenhouse gas emissions throughout our operations. In addition, we take a holistic approach to managing our regional watershed beyond the City's jurisdiction by collaborating with our Regional Partners (cities served by our wastewater treatment plant), local nonprofit organizations (e.g. Laguna Foundation and Russian River Watershed Association), and the Sonoma County Water Agency (our water wholesaler). For example, we work with the Water Agency to ensure that flood control and water

supply operations in the Russian River watershed do not negatively impact threatened and endangered fish species. We work with the Laguna Foundation to protect the Laguna de Santa Rosa, the largest freshwater wetlands complex on the northern California coast. We staff a comprehensive Storm Water & Creeks Program to implement Santa Rosa's Storm Water Management Plan and Citywide Creek Master Plan. The Storm Water Team works to preserve and restore water quality and minimize flooding. The City's storm drain system includes over 75 miles of open channels/ditches, over 320 miles of public underground pipes, and over 18,000 structures representing over \$200 million in storm drain infrastructure investment. To manage storm water and ensure creeks and drainage facilities are maintained and renewed, the Storm Water Team provides biological and engineering services, conducts public outreach and education, oversees construction sites, inspects industrial facilities, investigates illicit discharges, and enforces City ordinances. Funding for these efforts comes from a parcel assessment, grants, and City General Funds.

Our economic objective is to be fiscally responsible to our rate payers and to collaborate with businesses and industries interested in operating in Santa Rosa. We continually examine our practices to identify strategies to reduce costs and/or increase cost-effectiveness and efficiency. Annually we analyze and adjust our rate structure to ensure revenue will recover operating costs fully, allow us to maintain and renew the water system, and provide incentives for water-use efficiency (and avoid the need for expensive system expansion). Our rate structure provides adequate funds for operations and maintenance, rate stabilization, drought management, and timely response to catastrophic events.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Santa Rosa Water embraces an organizational culture that inspires positive change and empowers the workforce to imagine, create, test, and implement innovative approaches from every day work to extreme challenges. It enforces a culture of managing and recovering valuable resources, rather than one of the disposal of "waste." It promotes leadership that establishes a long-term vision for the organization, embodies a commitment to cultivating the organization's culture, and embodies communication that creates employee understanding, makes knowledge more productive, and harnesses the power of employee engagement.

### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<p><i>Number of sessions, number of people and type of workforce development activities conducted (e.g., trainings)</i></p>	<p>Water employees are involved in an organization-wide "Career Development &amp; Enrichment Program." "Our mission is to assist employees in learning pathways to achieving success in the Organization." The purposes of this program are to:</p> <ul style="list-style-type: none"> <li>• Invest in and retain current employees.</li> <li>• Raise morale, levels of engagement and encourage teamwork.</li> <li>• Create a support, development and recognition network across our departments.</li> <li>• Develop future leaders and cultivate the next group of employees to fill key positions in the organization.</li> <li>• Transfer knowledge and "know-how" among City employees.</li> <li>• Raise skill levels, encourage teamwork and accelerate leadership development.</li> <li>• Give employees the opportunity to focus on specific career goals and their next potential promotion.</li> <li>• Provide self-assessment tools to create a game plan.</li> </ul>

	The program includes a skills-based and a position-based mentoring program. Many employees have increased their professional development, knowledge, skills and abilities through this program which has had a positive outcome in succession planning.
<i>Level of employee engagement in the goals and vision of the Utility of the Future business model</i>	<ul style="list-style-type: none"> <li>• All Water Department employees participate in department-wide strategic planning that establishes the mission, vision and goals for the Water Department as part of the 5-year strategic planning process.</li> <li>• Each of the 23 sections of the Water Department participates in a department-wide Steering Team process by completing 5-year strategic plans. Water Department Senior Staff is committed to supporting the goals and strategies developed by individual sections by actively supporting the overarching themes.</li> <li>• The goals include education, meeting and exceeding present and future regulations, protecting public and environmental health, fiscal responsibility and cost-effectiveness, planning for the future workforce and infrastructure needs, and collaboration.</li> </ul>
<i>Number of open positions that internal candidates can qualify for, as a result of employee training and enrichment programs</i>	Santa Rosa Water has over 80 job classifications that serve the department's mission to protect public health by sustaining water resources, infrastructure, and the environment. Through various training, cross-training and the Career Development & Enrichment Programs, our employees increase their success in qualifying for, and promoting to, other positions.
<i>Resource efficiency improvements related to staff utilization</i>	Santa Rosa Water has various Wellness and Safety Committees that are comprised of department section representatives who meet regularly to discuss continuous process and quality improvements and safety items.

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Santa Rosa Water's Biosolids Distribution System reuses nearly 27 thousand tons of biosolids annually. Biosolids are a nutrient-rich organic material resulting from the water recycling process. Santa Rosa

Water’s biosolids are beneficially reused through land application to increase crop yields and composted for use in landscapes and gardens to enhance soil with nutrients, such as nitrogen and phosphorus.

Ongoing exploration and evaluation of alternative uses for biosolids Platinum Level

Certification in the National Biosolids Partnership for our Biosolids Management System Program

Procedures to reduce generation of biosolids in treatment systems

Implementing High Strength Waste (HSW) receiving station that will reduce biosolids volume.

Performance Measures & Results:

Your Performance Measure(s)	Your Results (quantitative or qualitative)
<i>Percent of biosolids beneficially used vs. total volume produced on an annual basis</i>	<ul style="list-style-type: none"> <li>• Landfill: 2,349 wet tons used as alternative daily cover which is a beneficial reuse.</li> <li>• Land Application: 9,585 wet tons</li> <li>• Compost: 8,514 wet tons</li> <li>• Temporary Storage: 7,371 wet tons to be used later for land application</li> <li>• <b>Total:</b> 27,819 wet tons produced</li> </ul>
<i>Quantification of natural resources conserved through substitution (e.g., pounds of phosphorous or other fertilizers substituted for by biosolids)</i>	3,840 lbs of chemical nitrogen fertilizer were conserved by using biosolids
<i>Biosolids Management Performance Report</i>	Produce an annual Biosolids Performance Report which details environmental performance, regulatory compliance, contractor activities, outreach to interested parties, management review, audit results, progress towards goals and objectives, and routine monitoring and measurement.

**COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Use of a Triple Bottom Line approach, including engagement with stakeholders, to analyze growth planning alternatives, considering financial, social, and environmental costs and benefits
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Santa Rosa Water actively collaborates with the community, local organizations, and interested parties to enhance the overall environmental, economic, and social well-being of the community. Santa Rosa Water works with our community to gain awareness, engagement, and to create opportunities for involvement. Santa Rosa Water offers a variety of green programs, trainings, and rebates along with knowledgeable and helpful staff. Our outreach efforts include, public meetings, workshops and classes, public information booths, newsletters, radio, events, website, and social media.

Outreach conducted with other stakeholders and other community groups (e.g., regulators, local officials, watershed groups).

Actively promotes community awareness of the value of water and wastewater and storm water collection and treatment’s role in the social, economic, public, and environmental health of the community.

Involves stakeholders in the decisions that will affect them, understands what it takes to operate as a “good neighbor,” and positions the utility as a critical asset to the community.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Number and type of specific projects completed (e.g., rain gardens installed, innovative technologies, or other innovative practices adopted) associated with a partnership</i>	<p>As a member of the Sonoma-Marín Saving Water Partnership, Santa Rosa Water was able to inspire the following actions in 2014:</p> <ul style="list-style-type: none"> <li>• <b>5,355,996 gallons</b> of water was saved by local businesses through <b>sustained reduction</b> programs where rebates are provided for implementing process changes and equipment upgrades resulting in measurable water use efficiencies.</li> <li>• <b>507,222 square feet</b> of lawn were removed through <b>turf conversion</b> programs — enough to cover nearly nine professional football fields.</li> <li>• <b>45,069 page views on wateroff.org</b> – a website created to keep the region informed about drought resources.</li> </ul>



	<ul style="list-style-type: none"> <li>• <b>23,061 students</b> in 823 different classrooms received curriculum materials provided by the <b>Water Education Program</b>.</li> <li>• <b>7,058 actions</b> were inspired by the <b>Community Resilience Challenge</b>.</li> <li>• <b>8,037 students</b> received <b>direct</b> instruction by Water Education Program staff in the classroom, on technical tours and during field study sessions.</li> <li>• <b>5,148 drought kits</b> were distributed during the <b>Drought Drive-Up Event</b> held at 10 locations throughout Sonoma and Marin counties on April 23, 2014.</li> <li>• <b>4,410 Water Smart Home evaluations</b> were performed. These in-home water efficiency assessments were performed by trained technicians to find opportunities for improvements, identify leaks, and inform homeowners about their indoor and outdoor water use.</li> <li>• <b>3,540 rebates</b> were issued to <b>residents</b> for replacing their old, inefficient toilets with new, EPA WaterSense labeled <b>high-efficiency toilets</b> that flush at 1.28 gallons per flush or less.</li> <li>• <b>2,379 high-efficiency clothes washer</b> rebates were issued. These EPA EnergyStar rated clothes washers use 40 to 60% less water than older, top loading models and they save energy from heating less water and wringing out more water before the clothes go into the dryer.</li> <li>• <b>2,210 high school students</b> learned about the water system and explored career opportunities in the field of water.</li> <li>• <b>941 rebates</b> were issued to <b>businesses</b> for installing <b>high-efficiency toilets and urinals</b>.</li> <li>• <b>720 guests</b> visited the nine gardens that participated in the <b>Third Annual Eco Friendly Garden Tour</b>.</li> <li>• <b>151 businesses</b> participated in our <b>water use survey</b> programs.</li> <li>• <b>47 videos</b> were submitted for the high school video contest themed "<i>There's a Drought On! Turn the Water Off!</i>"</li> </ul>
<p><i>Number and type of formal recognitions of partnerships by outside groups (e.g., state or national award) and any associated results for the community (e.g., acres of green space added in the community)</i></p>	<p>Sonoma-Marin Saving Water Partnership received the 2014 U.S. EPA Partner of the Year Award for its work in educating landscape professionals through its WaterSense labeled Qualified Water Efficient Landscaper (QWEL) professional certification program in irrigation system auditing.</p>
<p><i>Performance improvements resulting from a partnership (e.g., reduced volume of flooding or reduced greenhouse gas emissions)</i></p>	<p>Santa Rosa Water, in close coordination with the County and Water Agency, developed and adopted a citywide creek master plan in august of 2013. This includes policies and recommendations for improvement to nearly 100 miles of Santa Rosa Creeks. Over 20 agencies were involved.</p>
<p><i>Number of ongoing communications network actions/activities (e.g., website hits, newsletters, social media activity)</i></p>	<p>Santa Rosa Water's communications network includes our -  Webpage – srcity.org/water (15,000 page views per month)  Social Media – Facebook (1,679 likes), Twitter (2,035 followers), and NextDoor (13,526 members)  e-Newsletter (4,000+ subscribers)  Monthly bill inserts  Monthly radio ads</p>

	Community meetings, booths at outreach events, Annual Water Smart Expo (estimated attendance 1,500), Annual Earth Day Festival (estimated attendance 4,000), Annual Family Fun Day (estimated attendance 300), Tours
<i>Type and number of working agreements and collaborative initiatives for growth planning between and across different levels of government</i>	<p>Santa Rosa's overall green vision and goals are supported by our General Plan, other master plans, City ordinances, a variety of internal policies, projects, programs, innovative staff, and public participation.</p> <p>In order to achieve these goals, the City developed the Mayor's Climate Change and Sustainability Task Force in 2009. In support of these efforts, a city-wide Technical Advisory Committee has been steadily working in eight program areas:</p> <ol style="list-style-type: none"> <li>1. Renewable Energy</li> <li>2. Education and Outreach</li> <li>3. Finance</li> <li>4. Green Building</li> <li>5. Land-use, Legislation, and Regulation</li> <li>6. Transportation</li> <li>7. City Facilities and Operations</li> <li>8. Water Resources, Water-Use Efficiency, and Water Recycling</li> </ol>

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Santa Rosa Water actively pursues energy efficiencies as a result of our long-standing commitment to energy management and sustainability. Based on studies conducted by outside entities, Santa Rosa Water is at the top tier nationally in its energy performance and practices. Santa Rosa Water's dedicated Energy & Sustainability Team is implementing a five-year strategic plan to help Santa Rosa move toward our goal of energy independence. As part of the implementation of the Strategic Plan, we are developing an Energy Policy and preparing an Energy Optimization Plan for all of our operations (water production and delivery, sewer collection and treatment, and water recycling), which will result in implementation of a diverse group of projects that enhance energy efficiency, reduce energy demand, increase renewable energy generation, and improve energy management.

Employee performance plans established that include energy program-related activities to support the utility's energy vision and goals

Energy Optimization Plan (in development) as part of utility's overall strategic plan

Energy Policy (in development) as part of utility's overall strategic plan

Energy efficiency evaluated for equipment purchases and capital projects

Energy performance audits or other similar mechanisms in place and evaluated , where appropriate  
Participation in voluntary energy efficiency programs

Compliance with energy efficiency measures identified in the City of Santa Rosa's Municipal Climate Action Plan Utilization of energy conserving equipment wherever possible (e.g., utilization of peak shaving equipment to reduce usage)

### *Performance Measures & Results*

- Translation of energy use/intensity reductions to greenhouse gas emission reductions – to date and anticipated in the future
  - o 6 million pounds of GHG reduction in Santa Rosa Water's operations (pumping, treatment, etc.);
  - o 12 million pounds of customer GHG reduction due to high efficiency plumbing fixtures
- Current and anticipated renewable energy projects or activities
  - o Further reducing dependence on fossil fuels and outside power providers (like PG&E). Santa Rosa Water currently meets about 20% of its electricity demand via generating its own energy.
  - o At our Laguna Wastewater Treatment Plant (LTP), the City uses 100% of the digester gas produced to generate about 7.8 million kilowatt hours of electricity each year using combined heat and power engines (13% of demand).
  - o Santa Rosa Water has also installed solar voltaic arrays on various sites to generate 650,000 kilowatt hours of electricity annually, which are used to power lighting, pumps, and equipment in its facilities (1% of demand).
  - o High Strength Waste Facility at Laguna Treatment Plant is used for energy production for the operation of the Plant (under construction).

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes

- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Santa Rosa Water’s energy generation and resource recovery efforts help to minimize the use of non-renewable energy, generate renewable energy, and recover energy. In doing so, Santa Rosa Water is optimizing performance, minimizing its carbon footprint, improving climate resiliency, and better managing energy costs and requirements.

High Strength Waste Receiving Station, providing feedstock for co-digestion and combined heat and power production, is currently under construction.

Utility board/city council/board of supervisors have an energy and/or sustainability committee in place

Member of the Bay Area Biosolids to Energy (BAB2E) program, bayareabiosolids.com. Benefits include: converting biosolids and green waste to energy, decreasing greenhouse gases, and helping meet goals set by California Global Warming Solutions Act (AB32).

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Reduced non-renewable energy use and carbon footprint (e.g., percent of non-renewable energy use reduction, percent of greenhouse gas emissions reduction)</i>	9,379 megawatt hours (Mwhrs) of energy produced in 2015, reducing non-renewable energy consumption by 6,000 Mwhrs (64% of utility power is non-renewable energy).
<i>Reduced reliance on the power grid (e.g., percent reduction of energy utilization coming from the grid), and corresponding reduced vulnerability to climate change and energy price fluctuations</i>	27% of the wastewater treatment plant’s energy needs were generated on-site in 2015.
<i>Cost savings (e.g., return on investment proceeds and/or avoided energy costs) Percent increase in renewable energy production (e.g., solar generation) or utilization (e.g., purchase of renewable energy through the grid)</i>	\$937,900 in gross electrical savings were realized in 2015.

**NUTRIENT & MATERIALS RECOVERY**

Santa Rosa Water does not currently implement a traditional Nutrient Recovery Program, but our nutrient management activities are innovative and unique. Santa Rosa Water is considered to be a leader in water reuse. Through our urban and agricultural recycled water irrigation program, nutrients in our recycled water are beneficially reused as landscape or as agricultural fertilizers. Additionally, although our discharges to receiving waters are increasingly rare, our NPDES Permit does not allow any additional loading of phosphorus to the watershed because of water quality impairments related to nutrients. To comply with this stringent phosphorus limitation, i.e., “no net loading,” Santa Rosa Water

Beneficial Reuse of Nutrients through Recycled Water Irrigation:

Santa Rosa Water beneficially reuses its recycled water to the maximum extent possible each year and our recycled water irrigation program strives to ensure nutrients are applied appropriately to urban landscapes and agricultural lands through encouraging adherence to both hydraulic and nutrient agronomic rates. First, Santa Rosa Water actively discourages overwatering by metering and charging its urban customers for recycled water. Second, information on the nutrient content of recycled water is included on the Santa Rosa Water website and Santa Rosa Water provides weekly emails to Recycled Water Site Supervisors on a range of recycled water topics including nitrogen content of recycled water and adjusting fertilizer use.

#### Nutrient Offset Program:

Under the weight of an exceedingly stringent permit limitation requiring no net loading of phosphorus to the watershed, Santa Rosa Water developed and is now implementing an integrated approach to achieve zero net loading of phosphorus to the watershed. One part of this approach includes implementation of the regulatory-agency approved Nutrient Offset Program, the first of its kind in California. The Nutrient Offset Program allows Santa Rosa Water to reduce nutrient loads elsewhere in the watershed by an amount at least equal to the amount discharged into receiving waters, and of equivalent bioavailability. Expansion of this program to a broader water quality trading program is currently being evaluated by local regulators, regulated agencies and other interested stakeholders – again, this would be the first of its kind in California.

#### *Performance Measures & Results*

##### Annual Hydraulic and Nutrient Agronomic Rate Analyses

- Santa Rosa Water’s 2015 hydraulic and nutrient analyses confirmed that on a large majority of irrigation sites, recycled water was applied within appropriate hydraulic and nutrient agronomic rates. Out of 103 total irrigation sites, only three sites exceeded both hydraulic and nutrient agronomic rates, two sites exceeded only the hydraulic agronomic rate and three sites exceeded only the nutrient agronomic rate.
- Implementation of Nutrient Offset Program Projects. To date, Santa Rosa Water has implemented three Nutrient Offset Program projects.

#### **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

Santa Rosa Water’s advanced treated recycled water is a valuable resource for urban and agricultural irrigation, as well as recharging geothermal steamfields to produce energy. Recycled water is delivered to customers via Santa Rosa’s Recycled Water Distribution System which includes a 41-mile long pipeline to recharge Calpine’s Geothermal Geysers Steamfields to produce clean renewable energy for the region.

Reuse includes geothermal steamfield recharge, resulting in > 100 MW renewable electrical energy production In-house laboratory for testing water quality parameters

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Water beneficially reused</i>	Santa Rosa has an average daily dry weather flow of 17.5 MGD. In dry and normal water years Santa Rosa beneficially reuses 100% of our recycled water. Ratio of reuse to wastewater volume processed in 2015: 1:1. Approximately 1/3 of the recycled water is used for urban and agricultural irrigation and the other 2/3 is sent to recharge the Geysers Steamfields to produce renewable green energy for the region.
<i>Environmental benefits</i> <ul style="list-style-type: none"> <li>o <i>Amount of decreased diversion of freshwater from sensitive ecosystems</i></li> </ul> <i>Area irrigated solely by recycle water</i>	Santa Rosa Water beneficially reused 6,488 acre-feet of recycled water for agricultural and urban irrigation in 2015.
<i>Local supply</i> <ul style="list-style-type: none"> <li>o <i>Reduced dependence on purchased water and energy used to treat purchased water</i></li> <li>o <i>Climate-independent water supply of reuse water</i></li> </ul> <i>Enhanced utility and community resiliency to water supply and climate variability</i>	By using recycled water for landscape irrigation Santa Rosa Water helps reduce diversions from the Russian River.  The City is achieving water-related climate change mitigation by reducing energy use, replacing fossil fuel-based energy sources with renewable energy sources, and implementing aggressive water efficiency and conservation programs that reduce energy associated with the movement, treatment, use, and discharge of water.

**WATERSHED STEWARDSHIP**

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Green infrastructure deployment to enhance infiltration, evapotranspiration, treatment, or capture and reuse of stormwater
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - o Riparian reforestation to enhance pollution mitigation functions
  - o Stream channel restoration for increased hydrologic stability
  - o Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.

Santa Rosa Water staff and the community take great pride in being good stewards of our watershed. As a result approximately 1,500 acres in the Laguna de Santa Rosa Watershed were acquired. The primary purpose for these properties is for agricultural reuse of recycled water, but each property has opportunities for enhancing natural resources in the Laguna de Santa Rosa. Santa Rosa Water’s Natural Resource Program aims to balance the use of recycled water to grow food with the need to preserve

and promote biodiversity in the Laguna. In addition to the Natural Resources program, Santa Rosa Water has a robust Storm water Management Plan and Creek Stewardship Program. The major tool for this is the Santa Rosa Citywide Creek Master Plan which provides guidelines for the care, management, restoration and enhancement of nearly ninety miles of creeks in Santa Rosa.

Systems that add value to the urban landscape with resilient, adaptable, affordable and environmentally-sensitive water infrastructure that continues to provide basic services, but also enhanced recreational, aesthetic and environmental value

- Integrated program to address wet weather issues, including such sources as regulated stormwater, unregulated runoff (nonpoint sources), CSOs, SSOs, peak flow at POTWs, and source water protection
- Building code modifications that allow green infrastructure as acceptable options
- Integration of wastewater services with urban planning entities
- Financial methods that recognize the true cost of wastewater services and price it accordingly
- Participate in voluntary programs such as the Biosolids Management System
- Built environment that supplements the function of the natural environment
- Evaluation of water quality trading options
- Closed loop systems that enhance nutrient and energy recovery
- Outreach to adults and students in the areas of health of creeks and stewardship, sewage treatment and water use efficiency

### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Reduction in wet weather impacts (e.g., flooding, CSOs, SSOs, gallons of infiltrated water not reaching collection systems)</i>	Scheduled replacement of aging infrastructure
<i>Reduced unit costs for water quality improvements (e.g., financial benefits of a water quality trade)</i>	A Nutrient Offset Program is in development
<i>Enhanced pollution mitigation (e.g., sediment capture through green storm water infrastructure)</i>	Effective January 1, 2010 the City of Santa Rosa requires Low Impact Development (LID) Best Management Practices (BMPs) for all new development and re-development projects requiring post-construction storm water treatment BMPs
Building code modifications that allow green infrastructure as acceptable options	Implemented CALGreen + Tier 1 (California's green building code) and LID manual
<i>Increased hydrologic stability (e.g., reduction in flood-prone land area)</i>	<ul style="list-style-type: none"> <li>• Guided by the Citywide Creek Master plan</li> <li>• FEMA mapping ongoing</li> </ul>
<i>Created Ranch Plans to describe BMPs for agricultural lands included in the recycled water program, with a focus on minimizing non-point source pollution and natural resource management</i>	Increased setback and restoration to a minimum of 100 feet from bank on both sides of the creek.
<i>Creation or enhancements to wetland areas for natural treatment/storage</i>	Kelly Demonstration wetlands studied additional treatment of final effluent moving through a created wetland.
Riparian reforestation to enhance pollution mitigation functions and stream channel restoration for increased hydrologic stability	<ul style="list-style-type: none"> <li>• 1,980 linear feet of restoration on Colgan Creek. Phase 1 is complete and funding is being sought for Phase 2.</li> <li>• Prince Greenway Project removed riprap, restored meander and re-vegetated a portion of Santa Rosa Creek in the downtown area.</li> <li>• 5,000 linear feet of initial restoration on Gravenstein Creek. An additional 2,643 to increase setbacks to a minimum of 100 feet from each bank.</li> <li>• 2,550 on Irwin Creek, completing riparian restoration to a minimum of 100 feet from both banks.</li> <li>• 2,000 linear feet on Duer Creek, completing riparian restoration to a minimum of 100 feet from both banks.</li> </ul>
Removal of trash from illegal camping along creeks	In 2015, 840 cubic yards of trash and debris were removed from in or near creeks by staff, SAC (supervised adult crew), Youth Corps and volunteers
Raise awareness and prevent pollution from pet waste	Distributed 50,000 pet waste bags
Volunteer engagement and education in watershed stewardship.	In 2015: Engaged approximately 13,500 residents in educational and stewardship activities. Provided 204 creek related activities



	for school and youth groups, resulting in over 5,000 volunteer hours for the care of the watershed.
Conservation easements to preserve the ecosystem functions of undeveloped lands, and stream channel restoration	Conservation easement held by the Sonoma County Agricultural Preservation and Open Space District on 1,500 acres of land used in the recycled water program.
Participate in voluntary programs	<ul style="list-style-type: none"> <li>• The Biosolids Management System (BMS) was declared operational on June 21, 2007. The City has committed to follow standard procedures and steps developed by the <u>National Biosolids Partnership (NBP)</u>. These standards will be used to ensure environmental integrity of the City's Biosolids Program, improve effectiveness of operations, meet regulatory requirements, and address issues of concern to stakeholders and the public.</li> <li>• Member of California Storm water Quality Association (CASQA).</li> </ul>

## Scottsdale Water AZ



WATER  
RESOURCES  
UTILITY OF THE  
FUTURE  
TODAY

### Scottsdale Water AZ

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Water Reuse

Utility Description (combine all plants if a multi-site system)		
Multi-plant, water and wastewater municipal utility		
Service Area (square miles): 185	Average annual daily flow (MGD): 106 MGD	
Population Served: 229,000		
Location		
Street Address: 9379 E. San Salvador Dr.		
City: Scottsdale	State: AZ	Zip Code: 85258
Contact Information		
Name: Nicole Sherbert	Phone: 480-312-5689	Email: NSherbert@ScottsdaleAZ.gov

**NARRATIVE:** The City of Scottsdale Water Resources Division – Scottsdale Water – has been providing quality drinking water and advanced reclamation services to Scottsdale businesses and residents for over 40 years.

In 2015, Scottsdale Water delivered an average of 67 million gallons of potable water a day to our customers through over 2,000 miles of water pipes and mains, 14 pressure zones and 10,000 fire hydrants. Scottsdale’s reclamation system has approximately 1,400 miles of sewer collection lines and over 40 lift stations.

Scottsdale Water service area covers 185 square miles with over 89,000 active water accounts, about 90 percent of which are residential accounts, and approximately 80,000 active sewer accounts. Scottsdale is a long, narrow city, stretching 32 miles from south to north with an elevation change of over 3,700 feet. Located in the Sonoran Desert, Scottsdale, Ariz. has a very arid climate, averaging less than seven inches of rainfall annually.

Scottsdale Water’s vision – Water Sustainability through Stewardship, Innovation and People – is more than a statement in a planning document; it is who we are as a utility and what we work to achieve every day. Scottsdale Water constantly communicates our vision to both our employees and our customers and is committed to ensuring our product, our services and our culture exemplify this ideal.

The Scottsdale Water leadership team from the executive director through the line supervisors is encouraged and directed to be engaged with the workforce to identify areas to improve efficiency and effectiveness. Leadership engagement is accomplished through leadership development programs, an active suggestion box program, all-hands meetings, a lead operator forum, extensive training opportunities and day-to-day leadership.

Scottsdale Water demonstrates our commitment to the Utility of the Future model through our robust Effective Utility Management continual improvement program. The utility has adopted EUM as a defining cultural characteristic and identifies at least three EUM attributes for formal organizational improvement annually.

After identifying the three attributes for improvement, the Scottsdale Water management team creates and implements action plans to develop programs and initiatives to improve the organization. They then meet bimonthly to assess progress on these projects. The chosen attributes and related initiatives and programs developed for FY 2015/16 are as follows:

EUM attribute: Operational Resiliency

- Identify specific work areas for the potential of improving bench strength
- Launch a Scottsdale Water employee safety campaign
- Update Information Access System with current as-builts for each facility
- Evaluate the centralization approach of specific work groups, including maintenance and electrical

EUM attribute: Stakeholder Understanding and Support/Customer Satisfaction

- Create a Scottsdale Water Citizen Academy
- Upgrade Water Campus grounds appearance

- Identify customer complaint trends
- Implement “Comment Cards” concept across division
- Increase electronic outreach to citizens

#### EUM attribute: Operational Optimization

- Evaluate and optimize pumping control scenarios for pumpback system
- Develop a Chemical Cost Matrix for use in identifying savings
- Develop an Electrical Cost Matrix to identify opportunities to reduce energy demand

Initiatives and programs implemented through previous years’ EUM action plans include:

- Created the Apprentice Program in water and wastewater treatment
- Significantly expanded recruiting program
- Expanded SCADA communications planning
- Expanded emergency operations exercises and preparedness
- Initiated quarterly Operational Workshops focused on operational resiliency
- Implemented an electrical equipment assessment program
- Initiated a Technology Master Plan to be integrated into the structure of the integrated water and wastewater master plans

As part of our ongoing efforts to position ourselves as a Utility of the Future, Scottsdale Water launched an operations optimization project in 2010 to implement a new organizational structure, business processes and technology to bring all utility operations together under one holistic system of operation.

The efforts resulted in the creation of Scottsdale’s Optimization Program. The three main goals of the program are to:

- Effectively monitor, evaluate and coordinate the various utility operating systems.
- Maximize system effectiveness through efficient cost saving operations.
- Enhance water and wastewater service reliability.

Scottsdale Water took a business approach to optimizing our systems and adopted Lean principles to map out organizational and business processes to eliminate redundancy and highlight areas to streamline. Twenty-seven separate processes were mapped and evaluated to improve the business of producing, delivering, collecting and treating water and wastewater. Technology components were identified to aid in data compilation and accessibility, further enhancing overall utility operations. These early efforts helped Scottsdale begin to identify and eliminate departmental silos and move forward with a more collaborative approach toward operations.

A key component of the Optimization Program was its integration with the city’s water resources management into the daily operating process. Scottsdale Water has a long history of thinking and acting strategically with our water resources. Prior to the mid 1980s, Scottsdale relied entirely on groundwater for its water supply. Today, about 90 percent of our drinking water comes from two renewable surface water sources: the Central Arizona Project, which delivers water from the Colorado River, and the Salt River Project, which brings water from the Salt and Verde rivers and watershed.

Scottsdale is located within the Phoenix Active Management Area (AMA), which is a determination created by the Arizona Department of Water Resources in response to the 1980 Groundwater Management Act (GMA). The GMA established safe yield, where groundwater replenishment equals groundwater pumped, as a goal to be reached in the Phoenix AMA by 2025. Through multiple strategies, including reduced reliance on groundwater, increased use of renewable water supplies and aggressive groundwater recharge, Scottsdale was the first city in Arizona to reach safe yield and has done so every year since 2006 – nearly 20 years ahead of the state-mandated deadline to do so.

Scottsdale Water was one of the first cities in Arizona to implement aggressive, organized conservation efforts and established a formal Water Conservation Office in 1982. Ordinances passed in the early 1980s, which included prohibitions on wasteful water features and turf in model homes, helped engender a water conservation culture and awareness that continues today.

Scottsdale is the only utility in Arizona to offer rebates for water softener removal and WaterSense urinal installations. It is also the only water utility in Arizona to implement a data-based program to encourage customer awareness and engagement related to their water use. The two-year pilot program with WaterSmart software was launched in spring 2016 and includes customer communication tools, a comprehensive utility dashboard and extensive monitoring and analytics capabilities. The data and findings from the pilot program will be reported to Scottsdale's regional partners to help other utilities assess the efficacy of implementing similar programs.

Scottsdale Water's main hub is our 145-acre, award-winning Water Campus. It is the first true water campus in Arizona and has a 70 million gallon per day (mgd) water treatment plant, a 20 mgd water reclamation facility, a 20 mgd advanced water treatment facility, a groundwater recharge facility with 63 vadose recharge wells and a state-of-the-art water quality laboratory.

The Advanced Water Treatment (AWT) facility at the Water Campus is one of the largest and most sophisticated indirect potable reuse facilities in the world and has been an industry leader in this realm since the facility began operation in October of 1998. In addition to water for aquifer recharge, the Water Campus provides reclaimed water to 23 golf courses, enabling Scottsdale to support its flourishing golf and tourism industry with a sustainable water supply. Tourism – including golf and luxury resorts – is a significant economic driver, contributing over \$4 billion a year to the Scottsdale economy.

In its original construction, the AWT had a production capacity of 14 mgd of highly treated, RO-permeate recycled water. While the AWT was state-of-the-art and produced water that exceeded current regulatory requirements for open access irrigation and groundwater recharge, the city is always looking to the future and identified two issues that necessitated additional treatment technology and capacity: ☐ Future regulatory expectations for a variety of emerging Compounds of Potential Concern (CPC) in the groundwater recharge, and ☐ A desire from the golf courses to reduce the sodium levels in the finished water to less than 125 milligrams per liter (mg/l), which equated to more than a 50 percent reduction in what was currently being delivered in treated tertiary effluent.

These issues culminated in increasing the reliable capacity of the AWT to 20.6 mgd and implementing an advanced oxidation process (AOP) to address CPCs. The AOP implements a stepped chloramination disinfection process, ozonation and a high-intensity ultraviolet photolysis system and has significantly reduced the presence of CPCs in recharge water. Today, Scottsdale Water delivers approximately 8.3

mgd of recycled and nonpotable water for golf course irrigation and recharges over 1.5 billion gallons of ultrapure water annually.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Maintains a robust Effective Utility Management continual improvement program identifying at least three EUM attributes for improvement annually and creating and implementing action plans to improve the organization.

With the goal of increasing professional knowledge and experience, urges all hourly, non-exempt certified operators to participate in the Operator Certification Incentive Program, which encourages operators to achieve and maintain Arizona Department of Environmental Quality certifications above those required by their job descriptions. Operators can qualify for annual bonuses up to \$2,000 based on certification level.

Manages a formal, two-year apprentice program that provides a combination of hands-on and classroom training to prepare water and information technology professionals for a meaningful and challenging career. The program is offered in three different specialties and includes goals and achievement benchmarks that must be attained by program completion.

Master planning – Scottsdale Water budgets for long range master-planning updates at least every five years. Master plan updates focus on integrated water and reclamation master plans, however we are currently developing our first technology master plan aimed at examining how the division controls its systems and manages data.

Annually achieves safe yield, putting more water into groundwater aquifers than it takes out, by increasing the use of renewable water supplies and increasing the amount of recharge occurring within the service area.

Manages an operations optimization program that uses Lean principles to bring all utility operations together under one holistic system of operation and maps out organizational and business processes to eliminate redundancy and highlight areas to streamline.

Continually looks for innovative ways to encourage water conservation and educate customers about the importance of responsible water use.

Sets rates for water and sewer customers based on an annually updated five-year financial plan for each enterprise fund. The five year plans are used to ensure that rate adjustments generate sufficient revenues to cover the operating and capital costs of serving customers and to maintain adequate reserves in accordance with adopted financial policies.

Displays a commitment to the Scottsdale Water vision of Water Sustainability through Stewardship, Innovation and People by managing a robust internal communication program to ensure a knowledgeable and engaged workforce. The program includes quarterly division newsletters, all-division biannual meetings, lead operator forums between division director and operations leaders, bimonthly safety meetings and anonymous suggestion boxes placed at multiple facilities.

### *Performance Measures and Results*

<b>Performance Measure</b>	<b>Results (quantitative or qualitative)</b>
Effective utility management action plans	Action plans implemented for significant improvement in at least three EUM attributes annually.
Propose increased Operator Certification Incentive budget annually	Utilize full Operator Certification Incentive budget annually.
1) Annually assess the staffing needs within the water, reclamation and technology groups to determine impact to apprenticeship program. 2) Ensure apprentice positions are on schedule within the 2 year program.	1) Propose budgeted number of apprentice slots for upcoming fiscal year. 2) Establish detailed SMART goals for each apprentice as part of the formal evaluation process.
Master Plan update frequency	Not more than five years between plans
Amount of water (in million gallons) recharged above safe yield	Over 5,000 (in million gallons) annually.
Annual Utility System Operating Plan that manages supply sources, treatment, facility maintenance/construction, water quality, and energy use across potable, wastewater, reclaimed and irrigation water utility systems.	Developed by October 1 for following calendar year operations.
WaterSmart Pilot Program	Launch and evaluate the effectiveness of two-year WaterSense pilot program.
Daily Utility System Operating Plan	Developed and distributed by 11 a.m. for following 4-day period. Operate all utility systems within +/- 5% of the operating plan distributed the previous day.
Business, operational, maintenance and regulatory key performance indicators Disinfection By-Products	Monthly reporting of performance measures. Weekly review of performance indicators. Weekly review of potable storage management activities Bi-weekly review of DBP monitoring data Implement seasonal water supply changes to reduce DBP precursor concentration
Updates water and sewer five-year financial plans annually	Prepare and propose rate adjustments based on results to achieve rate stabilization over the five year planning period.
None-Revenue Water	Conduct AWWA NRW audit

## COMMUNITY PARTNERING AND ENGAGEMENT

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development



program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees

- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Hosts an annual six-week Scottsdale Water Citizen Academy designed to educate customers and stakeholders about all facets of Scottsdale Water operations, planning and policies. Actively works to educate customers about the value and quality of Scottsdale Water delivery and service, through outreach to schools, the city’s website, social and traditional media, water industry advocacy groups and community groups.

Maintains an active recruitment program aimed at promoting careers in the water and wastewater industry.

Manages an aggressive Water Conservation Program, which includes rebates, landscape workshops, home water audits, community involvement and classroom education programs, to encourage water efficiency and educate customers about protecting the desert’s most precious resource. Actively participates and/or holds leadership positions in regional and national water resource coalitions, including the Association for Municipal Water Agencies, American Water Works Association, WasteReuse Foundation, Water Environment Foundation, Water Laboratory Alliance, Government Finance Officers Association, WaterSense Partners, Water For People, Arizona Municipal Water Users Association, Water – Use It Wisely, Tap Into Quality, AZ WARN and Stormwater Outreach for Regional Municipalities.

In association with the United States Environmental Protection Agency, the State of Arizona and the responsible parties, manages the clean-up efforts of the North Indian Bend Wash Superfund Site (NIBW), one of the largest groundwater contamination sites in the country. Scottsdale Water has assisted in the management of the successful remedy and demanded that the treated groundwater be used for local beneficial use as part of the city’s drinking water portfolio. The upper aquifer is approaching cleanup completion and over 86,000 pounds of trichloroethylene (TCE) has been removed from the aquifers since 1994.

Regularly hosts tours of the Scottsdale Water Advanced Water Treatment Facility to educate media, industry peers, stakeholders, students and customers about the value of recycled water as a vital component of Scottsdale’s long-term water supply and the importance of investing in advanced recycled water treatment technologies to preserve the integrity of groundwater aquifers.

Maintains a 5.5-acre demonstration garden, the Scottsdale Xeriscape Garden at Chaparral Park, which conceals a buried 5.5 million gallon reservoir from the adjacent Chaparral WTP and showcases over 7,000 plants from 200 species of low-water-use plants and trees. Through signage and an interactive plant guide, park visitors can learn about low-water use plants and trees, water harvesting and other tips for caring for desert landscape.

### *Performance Measures and Results*

Performance Measure	Results (quantitative or qualitative)
Number of successful completions of annual Academy	At least 18 Citizen Academy graduates annually
Number of ongoing communications network actions/activities (e.g., website hits, newsletters, social media activity)	Website updated twice monthly, news release issued monthly, attend at least 15 community events annually. Website engagement (measured through hits and time on site) increases at least 10 percent annually.
Number of career fairs attended	At least two career fairs staffed annually
Water conservation outreach and education	Conduct at least 140 free residential exterior water audits with at least 98 percent of the customers rating the audit as “excellent” or “good.” Conduct at least 14 water conservation workshops with at least 98 percent of the attendees rating the workshop as “excellent” or “good.”
Superfund Compliance Rate	All samples taken as part of the of the NIBW cleanup are in full compliance with the 2003 Amended Consent Decree.
Number of tours of Advanced Water Treatment Facility hosted annually	Host at least 10 tours annually for diverse groups including industry peers and stakeholders, media and students. At least one proactive media story about water reuse published annually.
Garden tours and education	Conduct at least four group tours at the Xeriscape garden with at least 98 percent of the attendees rating the tour as “excellent” or “good.”

## ENERGY EFFICIENCY

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Working to complete pricing contract negotiations with the Western Area Power Administration, which administers federal allocations of Boulder Canyon Project (Hoover Dam) hydropower, for Scottsdale Water’s hydropower capacity allocation of 2,366 kW per year (the second largest municipal allocation in Arizona). This significant renewable power allocation represents approximately 12.5 percent of the total energy used at the Water Campus Reclamation Facility, the Advanced Water Treatment Facility and the CAP Plant.

Participates in the Arizona Public Service (electrical utility provider) voluntary, direct load control demand response program, Peak Solutions, designed to encourage customers to minimize electrical demand during peak load times.

Annually reviews the electrical cost matrix to identify opportunities to reduce energy demand and ensure all systems and facilities are operating under the appropriate electrical rate plan and program.

Installing variable frequency drives at booster pump stations to allow staff to adjust pump speed increasing flexibility of energy demand. Scottsdale Water is in the process of designing or re-constructing nine water booster stations. Most of these facilities will be equipped with VFDs to improve pump operation and reduce potential demand charges. For Reclamation, Scottsdale Water is in the design phase of a full VFD replacement and upgrade cycle for our five major Pumpback lift stations

Manages an operations optimization program that uses Lean principles to bring all utility operations together under one holistic system of operation and maps out organizational and business processes to eliminate redundancy and highlight areas to streamline.

Participates in the pump efficiency program offered under APS' Solutions for Business program. Scottsdale Water periodically engages APS' contractor to perform pump efficiency tests on large pumps suspected of running inefficiently. Scottsdale Water has secured multiple rebates for adding VFD units to pumps to gain operational efficiencies.

#### *Performance Measures and Results*

Performance Measure	Results (quantitative or qualitative)
Execute 50-year contract for federal preference hydropower effective October 1, 2017 with Western Area Power Administration / Arizona Power Authority	Meet 9 percent of Water Campus energy needs with renewable hydropower resource. Projected reduction of overall energy costs by \$500,000 within first 10 years of contract.
Annual participation in APS power demand curtailment program.	Sign updated curtailment strategy participation agreement prior to June 1 each year, which is the beginning of the annual participation season.
Energy use matrix: comprehensive database of facility electrical demand, energy use, and rate plan data.	Annual review of electrical rate structure and appropriate operational data for each facility. Request change in rate plan for individual facilities as available. Established interactive charting of 15-minute energy use and demand data for larger facilities.
Submetering conducted of critical process systems	Analyze data to manage energy use and demand more efficiently. Implement operational control system alerts for identified power demand thresholds.
Annual Utility System Operating Plan	Developed by October 1 for following calendar year operations. Manages supply sources, treatment, facility maintenance/construction, water quality, and energy use across potable, wastewater, reclaimed and irrigation water utility systems to ensure effective and efficient water systems.
More efficient pump operation	Reduced electrical demand charges. Install VFDs where there is potential to reduce demand spikes. Use efficiency pump testing data to address inefficient pumps.

## WATER REUSE

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

Operates an industry-leading Indirect Potable Reuse facilities, the Advanced Water Treatment (AWT) facility, which utilizes ozonation, microfiltration, reverse osmosis and ultraviolet photolysis prior to recharging the ultra-pure water into the aquifer. In 2015, Scottsdale Water recharged over 1.5 billion gallons of ultra-pure recycled water into the aquifer.

Manages the Reclaimed Water Distribution System (RWDS), a unique public-private partnership under which the city provides a blend of raw surface water, tertiary effluent and RO permeate, ultra-pure recycled water to 23 golf courses in north Scottsdale for turf irrigation. The RWDS consists of a 14-mile delivery system including pipes, pump stations and other facilities and has the capacity to deliver up to

20 million gallons a day of water that meets contractual water quality standards with sodium levels not to exceed 125 mg/l.

Regularly hosts tours of the Scottsdale Water Advanced Water Treatment Facility to educate media, industry peers, stakeholders, students and customers about the value of recycled water as a vital component of Scottsdale’s long-term water supply and the importance of investing in advanced recycled water treatment technologies to preserve the integrity of groundwater aquifers.

Participates in the Sub-Regional Operating Group (SROG), a five-city partnership that provides recycled water to the Palo Verde Nuclear Generation Plant, which is the only nuclear power plant in the world that uses treated effluent. Recycled water from SROG also supports agricultural irrigation and the wetlands development. The Tres Rios wetlands provide additional water quality polishing and serve as an educational and recreational site for the public.

Scottsdale’s Water Quality Laboratory developed in-house capabilities to analyze for emerging contaminants including endocrine disrupting compounds. As part of a collaborative effort, data was provided to the operations/treatment group illustrating contaminant removal through each stage of the treatment process to demonstrate treatment effectiveness and efficiency. This knowledge enables decision making about the best use of each treatment train, and can demonstrate to the public the City’s commitment to aquifer protection.

Administers the only rebate and education program in Arizona to incentivize water softener removal as a means of addressing high salinity levels entering the Scottsdale wastewater stream. The salinity, which is not removed in standard wastewater treatment processes, must be reduced before it can be discharged to the environment, either through turf irrigation or aquifer recharge.

*Performance Measures and Results*

<b>Performance Measure</b>	<b>Results (quantitative or qualitative)</b>
Ensure AWT Facility is fully operational to support recharge efforts.	Experience no more than a 24-hour unscheduled interruption in RO permeate production on an annual basis.
1) Meet the water volume demands of the RWDS customers. 2) Meet the water quality requirement of the RWDS customers.	1) Experience no more than a 24-hour interruption to water delivery requested by any of the 23 golf courses on an annual basis. 2) Do not exceed a 14-day rolling average of 125 mg/l sodium to the 23 golf courses on an annual basis.
Number of tours of Advanced Water Treatment Facility hosted annually	Hosts at least 10 tours annually for diverse groups including industry peers and stakeholders, media and students. At least one proactive media story about water reuse published annually.
Recycled Water sold to APS	Volume of recycled water sold as a beneficial end use
Laboratory analysis provided to water reuse efforts	Analyze for 31 emerging contaminants at six locations on a monthly basis.
Salinity education and outreach	Salinity brochure is updated/reprinted annually with current rebate offerings and salinity reduction information. Website updated twice annually with at least one significant web and social media outreach push.

## Spartanburg Water SC



### Spartanburg Water SC

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Beneficial Biosolids Reuse
- ★ Community Partnering & Engagement
- ★ Energy Efficiency
- ★ Energy Generation & Recovery

Utility Description (combine all plants if a multi-site system)	
Utility type: Regional system providing water and sewer service	
Service Area (square miles): Water - 264; Sewer - 215. Service areas overlap, but do not exactly coincide.	Average daily flow: Water – 24 MGD; Wastewater – 13.5 MGD
Population Served: Approx 200,000	
Location	
Street Address: Administrative Offices: 200 Commerce Street	

City: Spartanburg	State: SC	Zip Code: 29304
<b>Contact Information</b>		
Name: John Westcott	Phone: (864) 580-5685	Email: jwestcott@spartanburgwater.org

**NARRATIVE:** Spartanburg Water consists of two distinct political entities operating together under a common name. Spartanburg Water System is a Commission of Public Works created in 1908 by the General Assembly of the State of South Carolina to provide public water utility services to Spartanburg and surrounding communities. The system utilizes surface water from three large reservoirs totaling approximately 13 billion gallons of storage. The CPW is governed by a three member Commission elected by the residents of the City of Spartanburg. Spartanburg Sanitary Sewer District is a special purpose district originally established by Act No. 556 of 1929 to provide sewer transportation and treatment services. Act No. 1503 of 1970 added sewer collection to the District’s services.

The District is governed by a seven member Commission consisting of the three CPW Commissioners, three additional Commissioners elected by the residents of the District’s service area, and the Mayor of Spartanburg. The Commissions hire a single Chief Executive Officer to manage both entities, and the entities share common management, administrative, engineering, construction, maintenance, laboratory and other services. Spartanburg Water serves a population of approximately 200,000 including retail and wholesale customers, and has a combined annual operating budget of \$65M for the current fiscal year. Our mission is to provide quality water and wastewater services in a reliable manner. We are committed to protecting public health, being good stewards of the environment, and supporting our community's desired quality of life.

Spartanburg Water’s organization culture is defined by its resilience and the development of innovative solutions to the many environmental challenges and forces that can have both direct and indirect impacts on a modern utility. Ours is an “innovation culture” that results from an inclusive environment championed by all sectors of the organization. This is only achievable through an employee development and engagement process that focuses on diversity, collaboration and inclusion.

We make numerous opportunities for personal and professional development available to staff, including workshops and webinars, as well as safety, supervisory, leadership, ethics and diversity training sponsored by Spartanburg Water and taught by outside experts via the Upstate Employers Network and other organizations. We also offer tuition reimbursement for post-secondary education related to our mission. In addition, we sponsor two employees each year to the Leadership Spartanburg program. Founded in 1979 by the Spartanburg Area Chamber of Commerce, this is a nine-month course designed to better prepare leaders and volunteers for community service through exploration of issues, challenges and opportunities facing Spartanburg County now and in the future.

To address changes in the available workforce, Spartanburg Water, Apprenticeship Carolina and Central Carolina Technical College have partnered with the SC Environmental Certification Board to develop Apprenticeship Program opportunities for drinking water and reclaimed water treatment facilities. The Apprenticeship Program uses on-the-job training, education and wage progression as tools to develop an operational workforce that is registered through the US Department of Labor.

Over the past few years, Spartanburg Water has faced many challenges, including weather volatility, aging infrastructure, regulatory pressures, funding pressures and the changing dynamics of our

workforce. We have also experienced the effects of decreased water usage—the result of a shift from textile production to the more water-efficient automotive, advance material and aerospace industries. We have been challenged by these disruptions and we address them with resiliency strategies that provide both short-term solutions to address the pressures, as well as long-term values that will position Spartanburg Water to continue to be agile as our community grows and the variability in our industry continues. Spartanburg Water has remained agile and resilient by investing in new programs and ideas, including the introduction of our “Twice the Ice” business that has created a new revenue source to support the replacement of waterlines that have exceeded their useful service life. We have delivered 20 million pounds of ice and directed \$2 million dollars back from this investment to fund our five-year capital reinvestment plan to repair and replace aging infrastructure.

That “outside the box” thinking is welcome in our culture, and we thrive on the new ideas and fresh vision from our team members whose only mandate is strict adherence to our mission to provide quality water and wastewater services to our customers and the community we serve.

Spartanburg Water is also an innovator in green energy—we’ve been providing power to the R.B. Simms Water Treatment Facility through hydroelectric generators since 1926. As the plant and community grew, our hydropower units shifted from meeting all of our power needs at R.B. Simms to functioning as a power offset for operations. We now sell this green energy to our power provider, then buy it back at a lower rate, combining our water and power operations to maximize revenue from both. We participate in the provider’s “Powershare” program, which allows the provider to utilize our emergency diesel generation capability when needed in return for credits and incentives far exceeding the cost of participation. We have also begun implementing small solar power installations (typically 4 kW range) at various facilities to reduce dependence on grid power.

We regularly solicit new ideas from employees, receiving 50 – 60 suggestions annually through the employee suggestion program. We hold regular roundtable discussions where we solicit feedback and ideas through collaborative discussions between executive staff and front-line employees. Employees have contributed to efficiency of operations with numerous inventions. For example our “Ziggy valve,” designed and built by staff, provides an easily installed, removed, and reused means of blocking sewer service laterals without the need to install permanent shutoff devices. The “Pit Stick,” also employee designed and built, provides an easier, safer way to open manhole covers.

We have recently made a large investment in upgrading our business and customer service computer systems to improve efficiency and improve the customer experience. These upgrades: implement new technological capabilities and reduce manual processes where possible; upgrade electronic systems utilized by customers to provide more options; expand the capabilities of our Financial Systems, enhance financial info for managers, and provide accessibility to information for employees; and interface Purchasing & HR systems. The upgrade paves the way for a Wireless Service Order System that utilizes cellular technology to assign work electronically to field services & eliminate paper service orders, eliminates the need for Customer Service calling service orders to the field, and allows closing of service orders real time in the field, giving immediate information to Customer Service as to field status, thus allowing timelier response to customers. It also provides an enhanced portal with a more user friendly format for customers to view their bills online, view consumption and billing history, view account information, and report outages or other problems. Mobile applications enable customers to view & pay their bill, and report outages or other problems from their smart phone or tablet.



Spartanburg Water distinguishes itself as a community partner by demonstrating its commitment in a variety of ways, not the least of which are the many activities that its employees undertake in our service area. From our annual Day of Service, which has served as the centerpiece of the organization's volunteer efforts, to the number of community initiatives that we facilitate or support, we have developed a culture of respect and integrity that fosters strong internal relationships and promotes an external reputation for excellence and service. Our outreach and engagement activities include: Day of Service, with projects ranging from house repair and landscaping to cooking and serving the homeless; United Way of the Piedmont fundraising campaign to which employees may make one time or recurring contributions via payroll deduction, "Stuff the Bus" project which provides necessary school supplies for children, and "Bags of Love" which targets seniors living alone and dependent upon community agencies; Rxcycle Spartanburg prescription medication take back event; Paddle Fest, a variety of activities including an educational paddle tour of a reservoir, numerous classes, seminars, and races; Lake Sweep, our annual watershed litter pickup in conjunction with SC Department of Natural Resources' Beach Sweep initiative; Good Neighbor Program, funded through contributions by Spartanburg Water customers and implemented in partnership with the Salvation Army to assist needy individuals with paying their water and sewer bills; Community Benefit Program to encourage those doing business in the Spartanburg community, and in particular with Spartanburg Water, to further invest in the betterment of the community; Choose Tap, a health initiative in conjunction with the Mary Black Foundation's Way to Wellville initiative, to deliver the message that water is a key to wellness; "Water Matters," an interactive six-week public education initiative that highlights what we do as a utility from the watershed to the tap; New and Improved Web Site, [spartanburgwater.org](http://spartanburgwater.org), with full social media integration, including Facebook, Twitter, LinkedIn and YouTube, provides a digital home for the deployment of messages and tactics that will engage and inform Spartanburg Water stakeholders.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Mission Statement and Core Values: We clearly communicate and live by the mission of Spartanburg Water: to provide quality water and wastewater services to our region in a reliable manner. We are proudly committed to protecting public health, being good stewards of the environment, and supporting our community's desired quality of life. We are guided by a set of principles that enable us to provide superior service to our customers, our employees, our community and the environment, including:

safety, excellence, commitment to customer service, diversity, integrity and respect, innovation and creativity, accountability, and stability of purpose.

**Strategic Planning:** Spartanburg Water utilizes a capital master planning process that attempts to project needs 10 or more years into the future based on factors such as projected community growth, foreseeable future regulation, customer expectations for service, quality and cost, etc. Built into this process is a goal to control operational costs to meet customer demands for competitively priced services, i.e. the cost of operating future capital improvements is factored into the plan. The master plan initiative provides a far-sighted framework for the shorter term (5 year) financial and capital improvement (CIP) plans, which reach to the operational level.

**Supervisory Training:** Training for employees that have been promoted to a supervisory role or will potentially be promoted in the near future. Training is provided through organizations such as the Upstate Employers' Network, management and performance consultants, local companies, etc.

**Leadership Training:** Each year additional training is provided for our Leadership Team to continue to develop their leadership and management skills. Training is provided through organizations such as the Upstate Employers' Network, management and performance consultants, local companies, etc.

**Ethics Training:** Ethics training for the entire organization to be sure that business of Spartanburg Water is conducted in an ethical manner and to assist employees with tools to make ethical decisions at home and work. Training is provided through organizations such as the Upstate Employers' Network, management and performance consultants, local companies, etc.

**Diversity Training:** Diversity Training for the entire organization to help in understanding how our differences can make us stronger as an organization but also how our actions now prepare us for the changing and future community. Training is provided through organizations such as the Upstate Employers' Network, management and performance consultants, local companies and alumni of major corporations (for example Coca Cola).

**Tuition Reimbursement:** To assist Spartanburg Water employees in improving and developing their job skills. Any accredited post-secondary classes or degree programs that improve knowledge, skills and performance related to the employee's current job or future professional development are eligible.

**Apprenticeship program:** To address changes in the available workforce, Spartanburg Water, Apprenticeship Carolina and Central Carolina Technical College have partnered with the SC Environmental Certification Board to develop Apprenticeship Program opportunities for drinking water and reclaimed water treatment facilities. The Apprenticeship Program uses on-the-job training, education and wage progression as tools to develop an operational workforce that is registered through the US Department of Labor.

**Employee surveys:** Surveys are utilized to assess employee sentiment, engagement, and satisfaction with the overall organizational culture. These are typically conducted every 3 years, but subject specific surveys (wellness, for example) are used periodically as well.

**Employee suggestion program:** Originating within the Health and Safety program, the suggestion program has expanded to include almost every area of utility operation. Employees are encouraged to submit suggestions to enhance safety, efficiency, quality of products and services, cost savings,

communication, collaboration, etc. Cash awards and recognition are offered for suggestions that are implemented within the utility.

Employee roundtables: Collaborative discussions between executive staff and front-line employees to solicit feedback and ideas.

Leadership Spartanburg: Founded in 1979 by the Spartanburg Area Chamber of Commerce, this is a nine-month course designed to better prepare leaders and volunteers for community service through exploration of issues, challenges and opportunities facing Spartanburg County now and in the future. Each year we sponsor two employees to the Leadership Spartanburg program.

Personnel Planning System: Employees utilize various tools that help identify strengths and skills as they pertain to particular positions, as well as identify areas where development is needed. This process does not guarantee placement in any position, but is designed to assist employees in identifying career opportunities and developing needed skill sets to support eligibility for them. The employee is responsible for pursuing the developmental opportunities that are identified through this process so that if a particular vacancy occurs, he or she can be a viable candidate.

Career Interest Discussions: This tool provides the employee the opportunity to let the company know of and to explore his/her career interests and to start the process of identifying the possible developmental steps or actions that may be appropriate to advance those interests. Those who elect to participate must do an honest self-appraisal, research possible future opportunities, and have an open, frank discussion with the supervisor, who acts as a counselor and advisor in this process. While it is to the employee's and the Company's mutual interest to enhance the career opportunities of each individual, the major responsibility for career development rests with the employee.

Talent Pool: We use a Talent Management System that accepts on-line applications/resumes which are maintained in a searchable database. Candidates can be identified as talent pool candidates during the review process, even if not identified as candidates for the position for which they applied, allowing Spartanburg Water to pre-identify candidates with the needed education, skills, or experience for future job openings.

Interdepartmental Teams: Projects of all sizes are facilitated by assembling teams consisting of employees from various departments who have experience, knowledge and/or skills that can benefit successful implementation. This approach has been utilized in such diverse areas as facilities construction, operations troubleshooting, communications strategies, development of EH&S and Emergency Response protocols, strategic planning, watershed protection, and community engagement.

Embrace and Encourage Employee Innovation: Employees are encouraged to take an interest in seminars, webinars, industry research and publications and to bring forth ideas that benefit the utility in any way. This includes ideas for new or modified equipment or enhanced processes that improve safety and efficiency or simply make our jobs easier. Some employee innovations are mentioned in the narrative section.

Design-Build/Alternate Delivery approach to projects: Spartanburg Water strategically utilizes alternate delivery methods such as Design-Build and Progressive Design-Build. These methods allow Spartanburg Water to offer the best value possible on projects compared to traditional methods of construction procurement.

CMMS: We use an online Work Order System to record and track the progress of preventative and corrective maintenance tasks. The System is cloud based and available for use on all mobile devices allowing for an efficient workforce.

Predictive maintenance: Spartanburg Water takes a proactive approach to predictive maintenance by routinely inspecting equipment and evaluating predictive maintenance needs. Areas evaluated include, but are not limited to generator maintenance, switchgear cleaning, IR scanning, oil analyses, and vibration analyses.

Business and Customer Information Computer Systems Upgrades: Implement new technological capabilities and reduce manual processes; expand the capabilities of our Financial Systems, enhance financial info for managers, and provide accessibility to information for employees; interface with Purchasing & HR systems and GPS applications.

Intranet web site: An “employees only” version of our web site allows ready access to procedures, policies, performance measures, announcements, frequently used forms, job opportunities, etc. “WaterWeb” provides a medium for exchange of up to date information in an easily accessible, user friendly format.

#### *Performance Measures & Results*

- Internal vs. External Hires: Tracks opportunities for existing employees to advance within the organization.
- Monthly Turnover: Tracks effectiveness of retention efforts
- Security Incidents: Tracks effectiveness of efforts to improve safety/security of employees – downward trend in number of incidents over time.
- Health Insurance Cost: Tracks effectiveness of wellness programs

#### **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Participation in or certification in National Biosolids Partnership or ISO programs
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Reclaimed Water treatment Residuals: For many years, Spartanburg Water managed reclaimed water residuals by land application (beneficial reuse) in liquid form. While successful, this program was time, land and labor intensive, required extensive communication with the public, continual permitting activities, and brought with it the hazards, public perception issues, and expense of hauling liquid waste by truck. As transportation costs have steadily risen, sufficient acreage of suitable farm land within a reasonable distance of our facilities has fallen, and tipping fees have become more favorable, we have shifted our focus to dewatering and land filling of solid residuals, with an emphasis on minimizing the number of truckloads to be hauled.

Future Planning: Looking to the future, Spartanburg Water has developed a 20 year solids master plan that includes anaerobic digestion, solar drying, and potential waste to energy technology.

Other solids: Spartanburg Water accepts both septage and grease trap waste from within Spartanburg County at its largest reclaimed water treatment facility. Septage is processed through the solids management system. We have invested two million dollars in a grease receiving station and associated infrastructure to receive, segregate, and potentially reuse grease trap waste for beneficial purposes.

Drinking water treatment residuals: This material consists mainly of aluminum hydroxide floc and river sediment with the algal cells and other solid debris entrapped during the flocculation and sedimentation processes. This material is environmentally inert, but can serve as a soil conditioner with a low level plant nutrient content. We manage this material primarily by settling and thickening, recycling the supernatant water through the treatment process or discharging it via an NPDES permitted outfall, and land applying the remaining semi-solid material in accordance with an NPDES No Discharge permit on dedicated fields we own and maintain for this purpose.

#### *Performance Measures & Results*

- Solids Management Cost/Dry Ton: Tracks cost of solids management – used to guide decisions re disposal method
- Odor Complaints: Tracks complaints of unpleasant odor from customers and residents in the vicinity of treatment and solids handling facilities

#### **COMMUNITY PARTNERING & ENGAGEMENT**

- Partnerships in place with one or more community organizations, with specific name given to partnership and objectives for the partnership established (e.g., a formalized partnership among community transportation, parks, and land use organizations for the incorporation of green infrastructure to reduce flooding and overflows)
- Participation in projects with neighborhood groups/stakeholders to create recreational opportunities and community assets (e.g., parks, enhanced public space)
- Participation in regular meetings with community stakeholders and offering of environmental education opportunities (e.g., river walks)
- Web presence established with social media engagement

Day of Service: Since 2009, Spartanburg Water has held its annual Day of Service to provide its employees an opportunity to volunteer and give back to the Spartanburg community. A Saturday is set aside each April, with projects ranging from house repair and landscaping to cooking and serving the homeless. During the past seven years, more than 3,000 man hours have been donated to local nonprofits.

United Way of the Piedmont: Support includes an annual fundraising campaign to which employees may make one time or recurring contributions via payroll deduction, “Stuff the Bus” project which provides necessary school supplies for children, and “Bags of Love” which targets seniors living alone and dependent upon community agencies

Rxcycle Prescription Drug Take Back Program: Conventional wisdom has been to dispose of unwanted medications by flushing down the sink or toilet or throwing them away in the trash, but growing evidence of water contamination by these products has made this practice undesirable. In 2015, we

launched Rxcycle Spartanburg, a new collaborative program in partnership with Spartanburg Public Safety, Upstate Forever, Spartanburg County Recycling, Spartanburg County Sheriff's Office, Forrester Center for Behavioral Health, Presbyterian College of Pharmacy, and Spartanburg Regional Healthcare System to help provide resources for the community to return unused and expired medication. Spartanburg County Sheriff's deputies and City of Spartanburg Police officers staff return locations to ensure that medications are stored and transported according to U.S. Drug Enforcement Agency guidelines.

**Paddle Fest:** Each summer, more than 300 people attend our annual Paddle Fest, an array of outdoor activities including a sunrise educational paddle tour on our reservoirs, numerous paddling and educational classes, seminars, and races. Local environmental organizations and businesses participate to educate the community on watersheds and environmental protection efforts and to promote their businesses.

**Lake Sweep:** Each year area volunteers gather at Lake Bowen Park for Spartanburg Water's annual Lake Sweep. The event is held in conjunction with the statewide River Sweep/Beach Sweep initiative coordinated by the South Carolina Department of Natural Resources. During last year's event, a total of 245 volunteers (42 Spartanburg Water employees, 14 employee family/friends, 185 community volunteers, and 4 public service workers) combined efforts to remove over 7 tons of litter from roadsides and waterways within our watershed.

**Clean Stream Program:** Similar to the annual "Lake Sweep" in that both water quality initiatives are focused on removing litter from our roadsides and waterways, The "Clean Stream" Program coordinates smaller and more frequent events throughout the year. The benefit of this program is that clean-up efforts are expanded throughout the watershed, ultimately helping to further reduce the effects litter has on our water source and water supply.

**Annual Report Calendar:** Our annual report is provided to the public in the form of a two-year wall calendar. A water-themed photo contest open to the public is held to gather photos for the calendar, with cash prizes for photos selected. More than 200 photos were submitted for the contest.

**Good Neighbor Program:** The Good Neighbor Program is a charitable contribution program funded through contributions by Spartanburg Water customers and implemented in partnership with the Salvation Army to assist customers in need with paying their water and sewer bills. Approximately every two years, Spartanburg Water sends a Good Neighbor Enrollment Form as a bill insert to solicit participation by customers who may elect to make a one-time donation or a recurring donation added to the bi-monthly bill. The Salvation Army maintains the eligibility requirements and distributes the funds received for the Good Neighbor Program to Spartanburg Water customers.

**Community Benefit Program:** Spartanburg Water spends on the order of \$22M annually for operating and capital expenses, much of which flows back into the local economy. To encourage those doing business in the community to further invest in the betterment of it, we are incorporating into our Procurement Policy a mechanism for them to include a voluntary Community Benefit in bids to supply goods and/or services.

**Choose Tap Campaign:** Spartanburg Water and the Mary Black Foundation, through the Foundation's "Way to Wellville" initiative, are combining our respective missions to drive the message that water is a

key to wellness. Our “Choose Tap” campaign seeks to educate the community on the health and economic benefits of tap water as their beverage of first choice. Efforts include educational materials, new water fountains/bottle filling stations in schools and public areas, and the conspicuous presence of our “water wagon” offering “original” and “chilled” tap water at public events.

**Water Matters:** In 2015 we launched a program called “Water Matters,” an interactive six-week public education initiative that highlights what we do as a utility from the watershed to the tap. The first class of 25 customers received an inside look at the work we do on a daily basis, with a particular focus on water treatment and water quality, infrastructure rehabilitation and renewal, fire service, green energy and watershed maintenance, including a field trip to visit the R.B. Simms Water Treatment Facility and the Lake Blalock Dam. The first round was well received, and will become an annual event.

**The New and Improved SpartanburgWater.Org:** In 2015, Spartanburg Water launched a new web site with full social media integration, including Facebook, Twitter, LinkedIn and YouTube. The new website provides a digital home for the deployment of messages and tactics that will engage and inform Spartanburg Water stakeholders.

**Business and Customer Information Computer Systems Upgrades:** In addition to the internal financial and information sharing benefits described in Activity 1, these new systems are significantly improving the customer’s experience when interacting with the utility, providing an enhanced portal with a more user friendly format for customers to view and pay bills online, view consumption and billing history, view account information, and report outages or other problems. Mobile applications enable customers to view & pay their bill, and report outages or other problems from their smart phone or tablet, and an enhanced Interactive Voice Response system makes our automated telephone services more useful.

**Facility Tours:** Tours of our major facilities are available to schools, colleges and community groups upon request. Within the bounds of customer safety, groups are shown the treatment processes and sequence, and have the opportunity to have any questions answered by our staff of water professionals.

**Speakers Bureau:** We have a group of employees well versed in water issues and processes who stand ready to provide formal or informal talks, host Q&A sessions, conduct school presentations, judge science fair projects and meet other requests from the community.

**Participation in local, state and federal government:** We take an active role at all levels of government, maintaining contact with elected officials, providing data and testimony before committees as required, and participating in various civic, business and technical organizations. Examples include local and state Chamber of Commerce, workgroups sponsored by state environmental agencies, DOT, state Environmental Technical Committee, Water Utility Council, and SC Water Quality Association.

**Project Communication:** When we perform projects that may directly impact our customers in some way (water service, traffic disruption, aesthetic impacts, etc.), we employ a variety of communication tactics to keep them informed from start to finish. These may include letters, e-mails, meetings, published schedules, project updates on our website or social media outlets, press releases and even door-to-door notifications as appropriate to the situation. Our goal is to assure that our customers know what we are doing, why we are doing it, when we start and finish, and what impacts and benefits they may expect.

Participation in statewide water use planning: We were actively involved in the five year process of developing South Carolina's first surface water withdrawal permitting legislation, participating in several multi-sector workgroups and providing input to the General Assembly. We now are participating in a project to model water quantity and availability across the state to provide meaningful information for planning of future economic growth and development consistent with appropriate conservation of water resources.

#### *Performance Measures & Results*

- Call Center Stats: Tracks customer utilization and performance of customer service functions
- Consumer Account Services OT: Tracks OT recovered for customer service functions – generally declining trend
- Payment Method Trend: Tracks customer utilization of various payment options
- Number of water quality complaints: Tracks a variety of customer complaints re taste, odor, color, etc. Used to guide treatment process, maintenance, etc. responses and corrective actions.
- Grease trap inspections: Tracks number of food service grease trap inspections
- SSO history: Tracks sewer overflows and helps in identifying areas where infrastructure improvement is needed.

#### **ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy efficient lighting: Old style incandescent or arc lamps are being phased out as it reaches the end of its useful life in favor of energy efficient LED lighting at various facilities within the company.

Automatic lighting: Occupancy sensing light switches are being installed in restrooms, meeting rooms and offices throughout the company.

Smart controls for HVAC: Standard thermostats are being replaced by programmable systems that activate HVAC only when needed.

Electrical systems upgrades: As older facilities are rehabilitated, electrical systems are inspected and if necessary upgraded to current standards for safety and efficiency. For example, our main water treatment plant was recently upgraded from a 2300 volt system to a 4160 volt system to improve efficiency.



Energy-smart operational strategies: Energy intensive processes are scheduled during off-peak periods to take advantage of lower rates and reduce peak demands on the grid. Examples include hypochlorite generation for Drinking Water Treatment and solids dewatering for Reclaimed Water Treatment.

Tailored pumping: Most facilities were originally built with single speed pumps, often resulting in inefficient operation with frequent stopping and restarting. These are being replaced with variable speed VFD pumps whose rates can be tailored to closely match demand, resulting in more efficient operation, fewer starts and stops, and less energy usage.

Powershare program: Allows the local power utility to operate our emergency generators for peak shaving, receiving substantial monetary credits in return. Credits generally exceed the cost of operation.

Utilize gravity as free energy wherever possible: Our main drinking water plant is engineered so that virtually all flow within the plant is by gravity, greatly reducing energy used for pumping. In addition, this plant is equipped with two hydroelectric generators driven by “surplus” water in the reservoirs beyond what is needed for reservoir maintenance and water supply. Our main reclaimed water treatment plant has a gravity outfall which can accommodate off-peak discharge flows on its own and reduce the pumping requirements for peak flows substantially.

Solar Panels supplement grid power: At several facilities, we have installed solar panels generating up to 4 KW of supplemental power. Smaller installations support such things as sensors and data repeaters, while the larger ones alleviate some of the power demand from buildings.

Alternative fuel vehicles/no idling policy: As conventional vehicles reach the end of their useful life, we are, where feasible, replacing them with alternative fuel (biodiesel, ethanol, CG-LPG, electric) and/or hybrid vehicles, resulting in cumulative incremental gains in efficiency of energy usage. Policy prohibits unnecessary idling of engines to reduce fuel consumption and emissions.

#### *Performance Measures & Results*

- Drinking Water Treatment Cost / 1000 Gal: Varies, as it reflects many factors in addition to energy savings
- Reclaimed Water Treatment Cost / MG: Varies, as it reflects many factors in addition to energy savings
- Powershare Savings: Consistently \$4-5K per month
- Reclaimed Water Power Cost: Varies with demand

#### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Hydropower Generation: Originally installed in 1926, a two-unit, 1.0 MW hydroelectric plant continues in operation at the main drinking water plant. These generators were fully refurbished as part of an extensive plant upgrade in 2014, giving them an efficiency boost of up to 20%.

Hydropower Exploration: In June of 2010, the Spartanburg Water Commission approved a resolution authorizing management and staff to explore the feasibility of sustainable, renewable energy resources, including hydroelectric, solar, and biomass applications. Since that time, Spartanburg Water has obtained from the Federal Energy Regulatory Commission (FERC) Preliminary Permits, which gave Spartanburg Water the right to conduct studies and investigate the feasibility of further developing its hydropower capabilities. Several candidate sites have been evaluated, however so far none have proven economically feasible.

Solar Power: At several facilities, we have installed solar panels generating up to 4 KW of supplemental power. Smaller installations support such things as sensors and data repeaters, while the larger ones alleviate some of the power demand from buildings. We did evaluate the possibility of a much larger scale (>1MW) solar installation, but the cost benefit balance was not sufficiently favorable to warrant implementation.

#### *Performance Measures & Results*

- Hydropower Produced (\$ Value): Varies with available water, \$ 0 – 30K monthly

## Stevens Point Wastewater Treatment Plant WI



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### Stevens Point Wastewater Treatment Plant WI

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Beneficial Biosolids Reuse



Energy Efficiency



Energy Generation & Recovery

Utility Description (combine all plants if a multi-site system)		
Type: Single Municipal WWTP		
Service Area (square miles): 13	Average annual daily flow (MGD): 2.805 MGD	
Population Served: 29,000		
Location		
Street Address: 301 Bliss Ave		
City: Stevens Point	State: WI	Zip Code: 54481
Contact Information		
Name: Chris Lefebvre	Phone: 715-342-4787	Email: clefebvre@stevenspoint.com

**NARRATIVE:** The goals of the Stevens Point Wastewater treatment facility are quite simple. Utilize a waste that nobody wants and efficiently recover three valuable resources from it: clean water, a nutrient rich fertilizer, and green energy. To successfully reach these goals the City Mayor, Sewer Commission, Director, and the facility's operations staff must work together seamlessly.

The belief that wastewater professionals are both stewards of the environment and business savvy is one that starts before the first day on the job. This mindset along with a well-rounded education is what the management staff looks for during the hiring process. This approach has led to the last six employees hired by the facility having a minimum of a bachelor degree in a wastewater related field. Once hired, new operations staff members are introduced to the facility's operation and efficiency goals on their first day. Goals are then discussed frequently with the entire staff to ensure they are always being considered when decisions are made. Staff members are encouraged to regularly attend off site training and utilize the knowledge gained to formulate new ideas to improve the day to day operations of the facility. The entire staff is given the opportunity to take part in every decision as it pertains to day to day operations as well as equipment purchases. This process allows the staff to take ownership in the facility and truly make a difference each and every day. The well-rounded education that the employees have when hired along with the training and experience they obtain from working for an industry leading facility, makes them prime candidates for high level positions throughout the wastewater field. This makes focusing on employee retention and training crucial to achieving the facility's goals. The Stevens Point Wastewater Treatment Facility is evidence that even good employee empowerment programs won't inhibit good employees from being lost to retirement or higher paying offers. Over the past four years two retirements have occurred and two staff members have left for new opportunities. This has led to four of the facility's six current employees being in their positions for less than five years. Yet, during these last five years the facility has continued to improve its treatment efficiency. This is proof that when management places a high priority on training, results can continue to improve.

To ensure a seamless transition when a staff member decides to move on, each staff member is trained to be proficient in all operations and tasks. The knowledge gained through this extensive training has led the City to historically fill its management staff with internal candidates. Promoting from within allows the utility to continue on a steady course and ensure that efficiency continues to play a key role in decision making for the foreseeable future. When internal promotion isn't possible great care is taken in selecting a candidate that has the dedication to reach the facility's goals. This type of succession planning requires the management staff to concentrate on retaining high level employees.

Having a staff of only 6 people to operate and maintain a 3 MGD facility as well as 15 off site lift stations most facilities would be happy to consistently meet their discharge permit limits. The culture at Stevens Point has continuously evolved over the past 15 years to the current approach of how to fully utilize the treatment capacity as effectively and efficiently as possible while not sacrificing effluent quality. Through this way of thinking the staff has been able to lower their total energy consumption by 22% with equipment upgrades and operational changes, while their BOD loadings have increased by 20%. Small projects like replacing a 50hp plant air compressor with a more efficient 10hp unit, and upgrading their aeration grid from ceramic stones to membrane discs have contributed to a lower energy demand.

Larger projects such as adding a 44hp submersible pump on a variable frequency drive to add efficiency and redundancy for their aging 100hp influent screw pumps, and replacing 20 year old positive displacement aeration blowers with new more efficient screw compressors have also had large impacts

on power consumption. In 2015, the facility finished a project that diverted a local business's high strength waste away from aeration and fed it directly to anaerobic digestion to further improve treatment efficiency. Operationally DO set points have been decreased, timers have been put on equipment to allow the staff to operate equipment only when it is needed, and all non-essential equipment has been turned off. Even after all of these changes the facility is still able to utilize biological nutrient removal to fully meet their effluent total phosphorus limit.

Starting in 2010 the treatment facility started utilizing its excess anaerobic digestion capacity through Co-digestion. The operations staff saw a need for high strength waste handling in the area and started a program to allow the acceptance of this material as digester feed. The facility now accepts over 10,000 gallons of high strength digester feed per day which accounts for over 25% of their digester feed by volume. This high strength waste is converted to biosolids and biogas in the anaerobic digestion process. After demonstrating the benefits of using the full digestion capacity, the facility took the next step in 2012 when they commissioned a 180KW biogas combined heat and power (CHP) unit. This CHP unit has since produced 89% of the electricity used by the facility and has led to net-zero power consumption for 13 of the 49 months it has been in operation. The heat from this unit and two biogas fired boilers is used to fully heat the anaerobic digestion process as well as provide heat to four buildings on site. The facility also utilizes its treated effluent as heating and cooling water in multiple on site buildings. Employing these resource recovery systems the facility provides over 80% of their heating and almost 100% of their cooling needs.

The Stevens Point Wastewater Treatment Facility produces a Class B liquid biosolid, 100% of these solids are beneficially utilized as agriculture fertilizer. The facility produces enough biosolids to fully fertilize over 400 acres per year with Nitrogen and Phosphorus. On average they provide over 3,000 tons of Nitrogen and over 2,000 tons of Phosphorus annually to local farmers. A project is currently in the planning stage to explore upgrading the biosolids handling process. This project which tentatively will break ground in 2017 will produce a Class A dried biosolid and fully utilize the facility's excess biogas.

These are just a few examples showing the innovation and dedication at the Stevens Point Wastewater Treatment Facility. As you can see, they are a leader in the industry and should be for the foreseeable future.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model

- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

Provides opportunities for employees to find and fix inefficiencies, share ideas for solutions to problems.

*Performance Measures & Results*

Operations Staff State Certifications	100% of Operations Staff is Wisconsin DNR Certified
Staff engagement in decision making	Operations staff is open to giving opinions about decisions that need to be made.
Operations Staff Off-Site Training	Staff regularly attends off-site training seminars on relevant topics

**BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

Actively planning for the future of biosolids management by moving ahead with a project to achieve Class A biosolids by utilizing excess Biogas to dry the biosolids.

*Performance Measures & Results*

- Percentage of Biosolids used beneficially vs. total volume produced: All of the facility’s biosolids have been used as an agricultural fertilizer for 15+ years
- Pounds of N and P used to offset commercial fertilizer use: Annually 3,000 tons of N and 2,000 tons of P are offset.
- Acreage fertilized annually: 400 acres/year are fully fertilized with N and P

**ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

Energy efficiency evaluated for all equipment purchases and projects

Participates in research activities

Removal of high strength beverage waste from the influent flow and Redirected to anaerobic digestion to treat the waste more efficiently

Utilization of equipment timers for peak shaving

Streamline operations to increase efficiency

#### *Performance Measures & Results*

- KWH used per 1000 lbs BOD removed: The 2015 annual average was 459 KWH per 1000 lbs BOD removed this value has steadily decrease over the last 15 years.
- Discuss energy usage with Staff regularly : The staff is very familiar with the energy usage and works very hard to keep the facility running efficiently
- Lbs of BOD diverted from the Influent flow into anaerobic digestion: More than 1200 lbs of BOD per day have been diverted from aeration and into the anaerobic digesters over the past 12 months.

### **ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

Heat recovery from the facility's effluent is used to heat and cool multiple buildings

Co-digestion with outside wastes (FOG, Dairy, Brewery, and Food Processing Wastes)

#### *Performance Measures & Results*

- Produce > 85% of electricity used onsite annually: The system has produced on average 89% of the electricity used onsite since 2012. Net-Zero has been accomplished 13 of the 49 months of operation.
- Produce enough biogas to operate the 180KW CHP unit at full speed 100% of the time: The digesters produced 99,780 cubic ft of biogas per day in 2015. The CHP unit needs 70,000 cubic ft/day.
- Maximize biogas utilization and effluent water heating/cooling to offset Natural Gas usage : The facility has offset over 80% of their natural gas needs by utilizing onsite resources.

## Trinity River Authority TX



The Trinity River Authority provides water and wastewater treatment, along with recreation and reservoir facilities, within the nearly 18,000-square-mile Trinity River basin.



### Trinity River Authority of Texas TX

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition



Organizational Culture



Watershed Stewardship

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.): Multiple plant Regional Systems		
Service Area (square miles): 919,475	Average annual daily flow (MGD): 205.39	
Population Served: 1,731,236		
Location		
Street Address: 5300 South Collins		
City: Arlington	State: TX	Zip Code: 76018
Contact Information		
Name: Fiona Allen, P.E.	Phone: 817-493-5100	Email: allenf@trinityra.org



**NARRATIVE:** 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. Employs more than 400 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 has carved a niche using innovative techniques to treat water and wastewater. It adapts and changes by involving customers and recruiting and retaining a skilled, diverse workforce. On a daily average, more than 165 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 2015, the plants were 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 were presented to Central Regional Wastewater System (CRWS), 21 years; Red Oak Creek Regional Wastewater System (ROCRWS), 15 years; Ten Mile Creek Regional Wastewater System (TMCRWWS), 13 years, and Denton Creek Regional Wastewater System (DCRWS), 10 years. The silver award was given to the Mountain Creek Regional Wastewater System (MCRWS).

Collectively, the plants have impressive treatment statistics.

<b>Regional</b>	<b>Rated</b>		<b>Service</b>		<b>Annual</b>
Wastewater System	Flow MGD	Contracting Customers	Area Acres	Pop. Served	Avg Flow MGD
CRWS	162	21	503.125	1,451,701	171.653
DCRWS	11.5	11	127.344	84,666	7.018
MCRWS	4.5	4	122.481	19,302	2.209
ROCRWS	4.6	6	77.775	33,726	4.591
TMCRWWS	24	5	88.750	141,841	19.919

TRA spent 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 adopted a five-year strategic plan in 2013. The plan considered what success looks like for the Authority based on current and anticipated future challenges. Seven goals and five core values encompass what the Authority embodies. The core values are the fundamental principles that

guide how TRA staff conduct themselves in pursuit of the mission and vision of the organization. Together, values provide an ethical framework for decision making and action. TRA 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 what they achieve.

TRA's longest tenured employee of over 45 years is a laboratory analyst and takes pride in mentoring the young women who come to the lab. "I'm always telling them to stay with us, stick around. You're not going to have any regrets," she says. She is real-world example of the way the culture at TRA allows people to grow and realize their own goals in parallel step with the organization's goals.

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. In a recent industry magazine, TRA team members stated the importance of management and an organizational culture that supports their participation. Also, competition knowledge advancements increase licensing, while building and reinforcing teamwork and discipline. The CReWSers won 19 state, 11 invitational, and 5 national championships.

Regarding innovative approaches from daily to extreme challenges, in 2013, one of TRA's engineers became chairman of the Texas section of AWWA's Diversity committee. He organized a panel discussion featuring female management at TRA. This was videoed and remains an excellent tool toward diversity discussion's that meet the challenge of building a workforce for the future that effectively addresses increased participation by women in the industry.

TRA has started a staff and career development academy and mentoring program. A guided interaction of setting realistic short-term or mid-term professional goals and learning to identify ways of achieving them includes developing abilities to present your “brand” — your experience, personal attributes, values, strengths and skills. Mentoring provides opportunities to build the potential of employees and foster professional relationships to collaborate and share insights to support the mentee’s career development.

TRA also supports a culture of managing and recovering valuable resources rather than one of the disposal of waste.

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.

TRA can be lauded for its treatment of valuable resources. In 2013, TRA celebrated the momentous achievement at CRWS by treating ONE TRILLION GALLONS during a 21-year period without any permit violations. It was noted to be the first sanitary sewer system to have achieved such a major milestone. This legacy of stewardship is carried through the organization’s efforts.

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 with a focus on comprehensive water quality; 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 watershed protection plan to help implement the Lake Arlington Master Plan to protect the water supply of over half-a-million people.

While TRA recognizes that each of these are important initiatives, they are paramount to our ability to continue to provide sufficient water for future generations of Texans struggling to balance water supply needs and ecology in a future of uncertain climate and hydrology.

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. In low-flow conditions, water in the river is almost entirely wastewater effluent.

TRA supports employee growth and engagement through outreach programs that encourage volunteerism and develops esprit de corps among staff. It provides incentives to staff members 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.

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 getting maximum use out of equipment and infrastructure before replacement is needed.

**ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

The TRA Safety Program consists of 10 employee safety committees and a coordinating committee. All accidents are investigated to identify/correct any safety issue, and all employee identified safety issues are investigated and for injured workers there is an active return-to-work program as well. TRA’s safety program was awarded the National Safety Council award in 2016, the George W. Burke Award in 2015 and the Occupational Excellence Achievement Award in 2015-2016.

TRA’s Executive and Leadership Development Academies focus on growing leader skill sets, knowledge and practical experience to positively impact our business and deliver on our strategic goals and core values. Mentoring is one aspect of the program that is designed to develop an employee under the direction of a leader who has expertise in a specific area and knows how to navigate within the organization’s culture. Mentoring provides an opportunity to build the potential of employees and foster professional relationships where both parties have the opportunity to collaborate and share insights.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Create and maintain employee programs, development and activities to engage all 400 + Staff members</i>	Promotes better employee morale and loyalty Applying positive training aspects while on the job Employees display modified behaviors Affords an awareness and commitment to workplace safety

<i>Introduce all employees to TRA policies, procedures, strategic plan and core values</i>	Increased operations efficiencies Increased retention of top talent Acquired intended knowledge, skills and attitudes
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## WATERSHED STEWARDSHIP

- Unified vision statement established that integrates water supply, water conservation, water recycling, runoff management, wastewater facilities planning, and infrastructure planning using a regional watershed approach.
- Watershed permitting strategy for multiple facilities (e.g., active nutrient water quality trading under a watershed-based permit)
- Ecosystem enhancements for improved hydraulics or water quality, including:
  - Riparian reforestation to enhance pollution mitigation functions
  - Stream channel restoration for increased hydrologic stability
  - Critical land acquisitions (e.g., conservation easements, buffer-zone purchases)
- Climate impact resilience principles incorporated into planning for new, repair, and replacement of infrastructure.
  - Environmental flow studies to balance future water supply needs with those of the environment.
  - Watershed protection plans to implement best management practices in water supply watersheds.
  - Scientific investigations into the source, fate, transport, and impacts of water quality constituents.
  - Model development to understand the impacts of pollutant loading on water bodies.
  - Coordinating regional NPDES permit holders through the Upper Trinity River Water Quality Compact group.

### *Performance Measures & Results:*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Reduce E. coli concentrations in Village Creek watershed to below 126 CFU</i>	This project is ongoing. A strong steering committee has been developed and source identification sampling is to begin shortly.
<i>Identify flow standards necessary to maintain a sound ecological environment</i>	Phase I studies have been completed to provide support for the recently-adopted flow standards.
Identify available water supplies above environmental flow criteria for future water supplies	Models have been developed that confirm the observed increases in the river base flows, suggesting additional supplies are available on a sustainable basis using reuse and conservation.
Quantify concentrations of certain emerging contaminants in the Trinity River	Investigations have been performed that suggest emerging constituents break down in the Trinity River despite turbid conditions.

## University Area Joint Authority PA



### University Area Joint Authority PA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Beneficial Biosolids Reuse



Water Reuse

Utility Description (combine all plants if a multi-site system)		
Type (e.g., single plant, regional system, multiple plants, collection system only, stormwater, etc.):		
<b>Regional System</b>		
Service Area (square miles): <b>84</b>	Average annual daily flow (MGD): <b>5.35</b>	
Population Served: <b>92,800</b>		
Location		
Street Address: <b>1576 Spring Valley Road</b>		
City: <b>State College</b>	State: <b>PA</b>	Zip Code: <b>16801</b>
Contact Information		
Name: <b>Cory Miller</b>	Phone: <b>814.238.5361</b>	Email: <b>crmiller@uaja.com</b>

**NARRATIVE:** The University Area Joint Authority provides wastewater collection, treatment, reuse, and disposal to the Centre Region, comprised of the communities that surround the Borough of State College and the Pennsylvania State University (“Penn State”). Established in the late 1960’s, the Authority has led the management of wastewater to a growing community and embraced sustainability and a forward thinking approach to wastewater management on a Watershed scale.

The Authority Beneficial Reuse Project – one of the key parameters of the program, and operational since 2005 - has provided hundreds of millions of gallons of potable quality reclaimed wastewater to the businesses and environment of the Centre Region. The core structure of this project is the Advanced Water Treatment (“AWT”) Facility, housed within the Spring Creek Pollution Control Facility. This multistage treatment facility upgrades secondary clarifier wastewater from the existing tertiary treatment process, providing a multi-barrier approach consistent with state and federal guidelines for indirect potable reuse. While the Authority does not currently provide indirect potable reuse, future plans have considered this as an additional facet of the project and the treatment goals of the facility mirror those requirements.

The reclaimed wastewater is stored and distributed to a regional transmission system and has a variety of customers that use the water for purposes such as commercial laundries, heating and cooling, landscape irrigation, and golf course irrigation. The Authority conducted watershed restoration with the reclaimed wastewater, constructing the Gordon D. Kissinger Meadow Project consisting of constructed wetlands. The Beneficial Reuse Project transitioned from providing commercial and industrial reuse to a stable, year round demand for water reuse to provide environmental enhancement.

While the primary goal is to provide an enhancement to local water quality, the Authority is also investing in green infrastructure to create nutrient and sediment reductions that can provide a mechanism for future growth in the Authority Service Area. As a regulated entity for controlling nutrient discharges, the Authority has annual mass limits for the discharge of Total Nitrogen and Total Phosphorus. While the Authority has historically provided outstanding treatment, and often is a nutrient credit generator, growth within the community constantly reduces the available nutrient capacity at the Authority’s wastewater treatment facility.

Through implementation of the green infrastructure program, UAJA is creating an incentive for the development of innovative stormwater treatment projects that can provide municipalities and planning agencies in the Centre Region an additional tool to ensure a balanced approach to growth and water quality in the Authority’s service area.

The third major area of Authority innovation is in its award winning Biosolids Composting Facility. The Authority combines primary sludge, waste activated sludge, regional sludge, and wood chips to produce their “CompostT” soil amendment product. This product has been used in multiple states and facilities such as the Cleveland Browns and Congressional Golf Course. The Authority has 100% of its produced biosolids placed into the community for commercial landscaping and soil amendment.

The Authority is a regional entity that has Board Members from five municipalities and participates in a regional COG comprised of six municipalities and representatives from the University. These entities complete regional planning jointly, allowing the Authority to lead these efforts and reach out into the community. Together, they have established a Regional Growth Boundary, allowing for up-zoning and

dense development within the boundary, ensuring that the sanitary sewer resource is managed cost-effectively and preventing community sprawl and extended facilities.

Internally, the Authority has a dedicated management staff that focus on the Authority's major operations including collection system, treatment facility, financial planning, and strategic planning. Under each area, there are superintendents and focused team leaders, for example there is a Team Leader for Compost Operations and a Team Leader for Laboratory Control and Operations. These teams interface weekly, identifying concerns and problems, training opportunities and safety needs.

In addition to its internal management, the Authority Board is interactive with the staff, identifying opportunities to partner in research with the University and innovative project concepts.

The Authority is now evaluating its next direction for improvements and views of the Utility of the Future Today program as an opportunity to incorporate other best practices and rebrand the Authority and City operations and mature its staffing to meet their changing operations.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

### *Performance Measures & Results*

- Safety and Training Committee: Meets monthly to identify safety concerns and pathways for correction. Also identifies need training and coordinates training activities.
- Staff Enrichment Program: Conducts monthly training programs for staff on basics such as CPR, First Aid, Confined Space Entry, etc. Also provides for wastewater treatment licensing testing and education.

## **BENEFICIAL BIOSOLIDS USE**

- Board/executive management policy created, advocating beneficial biosolids use
- Business case evaluation conducted for beneficial biosolids use program
- Marketing plan for products created
- Public involvement and education activities related to public acceptance and support of beneficial biosolids use

### *Performance Measures & Results*

- Impact on customer rates: Eliminated approximately \$400,000 in landfilling costs by conversion of Class A Biosolids



- Increase in agricultural land application: Sourced and located participants to allow for 100% of generated biosolids to be used in Commercial and Agricultural Land Application
- Regional Benefits and Leadership: Accept and Process Biosolids from neighboring small communities that cannot afford a Class A Biosolids Program

## **WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented
- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Reuse off-site for industry, power generation/cooling, golf course irrigation and other uses
- Development of programs to reduce risk of reuse and improve guaranteed reuse water quality
- Steps in communicating to the public the realities of IPR
- Internal plant methods to insure treated water quality fit-for-purpose reuse
- Use of in-house or external laboratories for testing water quality parameters

### *Performance Measures & Results*

- Reuse of Domestic Wastewater for Potable Water Substitute: Authority reuses 20% of its wastewater as potable water within the community, distributed over 15+ mi of transmission mains and storage tanks
- Climate-independent water supply of reuse water: Authority is expanding reuse to customers and industries as way to reduce reliance on groundwater based supplies to improve local water quality, not in response to drought planning
- Integration of Advanced Technology to improve Water Quality: Authority periodically revisits technology and recently added AOP with Ozonation to stay consistent with national trends and guidelines for future IPR

## Upper Occoquan Service Authority VA



WATER  
PRESERVATION'S  
UTILITY OF THE  
FUTURE  
TODAY

### Upper Occoquan Service Authority VA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Energy Efficiency



Energy Generation & Recovery

Utility Description (combine all plants if a multi-site system)		
Type: Single regional POTW that provides wholesale water reclamation services to four public bodies.		
Service Area (square miles): 240	Average annual daily flow (MGD): 33.1 (2015)	
Population Served: 296,000		
Location		
Street Address: 14631 Compton Rd.		
City: Centreville	State: VA	Zip Code: 20121
Contact Information		
Name: Tom Appleman	Phone: (703) 227-0202	Email: <a href="mailto:thomas.appleman@uosa.org">thomas.appleman@uosa.org</a>

**NARRATIVE:** UOSA's organizational culture and mission comes from its history. The Occoquan Reservoir is a component in a water supply system that currently serves over 1.4 million residents of Northern Virginia. During the suburban expansion of the Northern Virginia region in the 1960s, the reservoir's

water quality degraded resulting in massive algal blooms due to over enrichment with plant nutrients; periodic episodes of taste and odor in the finished drinking water; low dissolved oxygen levels; periodic fish kills; and generation of hydrogen sulfide in the bottoms waters of the reservoir. In 1968 - 1969 a study under the auspices of the State Water Control Board (SWCB), determined that water quality deterioration in the reservoir was caused by substandard wastewater discharges from 11 secondary wastewater treatment plants and non-point sources of pollution. In July of 1971 the SWCB adopted A Policy for Waste Treatment and Water Quality Management in the Occoquan Watershed (VSWCB, 1971). The Occoquan Policy was based on installing advanced wastewater treatment practices with effluent remaining in the watershed. The Policy included an implicit recognition that an indirect re-use of treated wastewater would become the operational norm in the Occoquan Watershed. It also recognized that extraordinary measures would be required to protect the public health in a situation where a water body was to be subjected to the competing uses of wastewater disposal and public water supply. UOSA has been operating under the Policy since its start-up in 1978. Following the commissioning of UOSA, the water quality of the Occoquan Reservoir has greatly improved. The Virginia DEQ recognizes the water quality protection benefits of the UOSA nitrified discharge on the Occoquan Reservoir in State permits. The UOSA plant is relatively unique in that the highly treated output from the plant supplies roughly 10% of the inflow into the Occoquan Reservoir, which provides drinking water used by the Fairfax County Water Authority. During drought periods the plant may briefly provide up to 90% of the reservoir inflow. In effect, Fairfax Water is drawing a portion of its influent from recycled wastewater. UOSA has proven, indisputably, that treated plant effluent is actually far cleaner than the stream sources of surface water inflow into the Occoquan Reservoir.

Promoting Ongoing Sustainably into the Organizational Culture: In addition to promoting water reclamation and reuse as part of its organizational culture, UOSA's Executive Management adopted a Sustainability Policy in January, 2012, that demonstrates UOSA's commitment to environmental, economic and social stewardship through sustainable practices. The goal is to maintain UOSA's cost effectiveness while attempting to achieve better environmental and social sustainability by incorporating sustainable business practices. The Sustainability Policy contains the following elements: Capital Improvements Design & Construction, Purchasing, Solid Waste Reduction & Recycling, Chemical Use, Energy Consumption, Fleet Management, Storm Water Runoff, Air Emissions, Office Administration, Sustainable Communication, and Sustainable Staffing.

The Sustainability Policy states, "UOSA will ensure all staff are fully aware of the Sustainability Policy and are committed to implementing and improving it. There shall be an open channel of communication about sustainability and the sustainable goals throughout the organization. The goal is to incorporate sustainable thinking in guiding every employee's day-to-day decisions."

A major factor in the successful organizational culture at UOSA is sustaining a highly trained, involved and dedicated staff. UOSA encourages membership and participation in multiple local, state and national professional organizations such as VWEA, VAAWWA, VAWARN, VAMWA, NACWA, WEF, WERF, AWWA, Work for Water and Water Reuse. UOSA staff have held committee chair, vice-chair, and member roles in both local and national chapters of these organization. UOSA staff have presented many technical papers at local, state and national conferences. Through these efforts, UOSA continues to attract and retain employees, who possess integrity, dedication and superior abilities.

In order to continually promote this organizational culture, UOSA has created many policies and procedures to promote a collaborative organization, open communication, employee development, training and continual improvement such as: New/Promoted Employee Evaluation; Open Door Policy; Grievance Policy; General Statement of UOSA Personnel Policy; Employee Recruitment & Promotion; Harassment & Non-Discrimination; Tuition Assistance; Family & Medical Leave; Corrective Action Procedures; Longevity Pay; and Rewards & Incentives Program.

UOSA has established career ladders for employees in the following areas of the plant: Laboratory; Information Management Section; Capital Improvement Section; Operation & Maintenance Division; and Treatment Process Division. These unique career ladders provide a mechanism for staff to chart a path to develop their skills and knowledge and to be fairly compensated as their knowledge and responsibility grows, and as they earn professional licenses and certifications.

Every UOSA employee participates in an annual performance evaluation where past performance is reviewed and goals and expectations for the next year are established. In addition, training and development needs are reviewed and input is solicited from each employee on how UOSA's management culture can better support them in their career development and job performance.

Effective communication about UOSA's organizational culture and sustainability efforts are done via new employee orientation, an annual State of UOSA meeting, department meetings, internal and external presentations, tours, emails, facility information management system, the internal and external webpages, posters, workshops, shift hand-off meetings, electronic Log (eLog) documentation of shift activities, standard operating procedures review and sign-off, written maintenance procedures, process incident notifications, regular maintenance and operation coordination meetings, brownbag lunches and other meetings as necessary. The following are examples of some of the online training modules that are provided to all employees: Why Conserve Energy?, Waste Recycling and Reduction, Sustainability Policy, Fiscal Sustainability Plan, SPCC Annual Training, Potable Water Reuse at UOSA ( <http://fims/DisplayContent.asp?ID=945> ), and The Cost of Over Treating Reclaimed Water.

UOSA has been actively pursuing and implementing energy conservation measures since 2005 to reduce the resources and costs to treat wastewater. UOSA tracks energy consumption by process, building and in some cases by individual pieces of process equipment in order to monitor and minimize these energy costs. The metric used is kWh/MG which has improved by 33.0% in ten years and 38.3%, from 4008 kWh/MG to 2472 kWh/MG, since FY2005.

UOSA has recently conducted two formal facility wide energy audits to identify energy and cost reduction measures. The first facility wide energy audit was conducted in 2003 and identified 24 energy conservation and cost reduction measures.

UOSA most recently completed a site-wide energy use assessment through a technical energy audit (TEA) under an energy performance contract in 2010. The TEA was a plant-wide review of all operations and facilities with the goal of identifying economically feasible energy conservation measures (ECMs) that would further reduce the annual energy costs and operational expenses. UOSA staff evaluated 56 potential ECMs as part of the TEA project before selecting those that showed superior savings and financial performance. The project scope included construction and implementation of the following ECMs:

- Facility-Wide Lighting Upgrades for Improved Efficiencies;
- Mechanical Systems Conservation Upgrades (HVAC);
- Heater Systems Controls Upgrades;
- Installation of High Efficiency Turbo Blowers for Aeration;
- Plant Water Systems Improvements; and
- Biogas Cogeneration Facility for Electricity and Heat Production

UOSA has also implemented other programs to increase equipment reliability and energy efficiency. One such program is the oil lubrication consolidation program. One of the goals of this program is to convert most of the oil lubricants to synthetic oils, which will reduce energy consumption due to their lower friction. A greater focus on precision and proactive maintenance techniques (for example alignment), will also decrease equipment energy consumption.

UOSA's anaerobic digestion process produces biogas at a rate that averages approximately 200 scfm. For years the biogas (60% methane) was used to fire boilers that produced steam that was used to heat the digester feed as well providing building heat. In 2013 UOSA installed a combined heat and power cogeneration unit (CHPCU) to generate electricity and recover heat for digester heating. The CHPCU consists of a GE Jenbacher ICE, cogeneration unit with a maximum rated heat input capacity of 7.838 MMBtu/hr and a maximum rated output of 1175 BHP (848 KW).

The CHPCU has been operating continuously since start-up with a greater than 90% up time. The CHPCU has produced 17% of the site's energy load and produced 14.3 million kilowatt hours of energy. This energy was produced using renewable resources, digester biogas, and has reduced electrical costs since start-up. CO<sub>2</sub> equiv emissions have been reduced by 15,010 tons. Additionally, UOSA uses a high lime, high pH process to remove phosphorous from its reclaimed water. The CHPCU combustion gases (CO<sub>2</sub>) are captured and used as an acid to neutralize the pH of the reclaimed water before discharge, thereby further reducing greenhouse gas emissions into the environment while also reducing costs for purchased CO<sub>2</sub> by approximately \$500,000 per year.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

UOSA has established an integrated and well-coordinated Mission Support Team (MST) that is made up of members from Executive Management, and Directors from Finance, Treatment Process, Operations &

Maintenance, and Technical Services Divisions. MST hold weekly meetings to coordinate organizational goals, activities and ongoing operational initiatives.

UOSA provides opportunities to consult with employees in new processes, innovations and designs before building through the use of design workshops that include participation from operations, maintenance, engineering, safety, environmental and finance personnel.

UOSA utilizes an “open door policy” and suggestion program that provides opportunities for employees to find and fix inefficiencies, and to share ideas for solutions to problems.

UOSA has established a multidisciplinary site Safety team, with participation from executive management that promotes an awareness and commitment to workplace safety. A safety suggestion program is also in place. In addition, Safety is incorporated into every employee’s annual performance plan.

UOSA holds employee appreciation events and annual awards banquets to celebrate exceptional achievements, plant performance and employee career milestones.

UOSA has established periodic tracking of progress toward meeting goals and milestones and generates an annual Sustainability Report that includes performance against metrics established in the Sustainability Policy.

UOSA has developed a Fiscal Sustainability Plan which incorporates the following elements: Critical Asset Management; Operation & Maintenance; Capital Improvement Program; Collection System Capacity, Management, Operation and Maintenance Plan; Reserve Maintenance; Flow projection; Comprehensive Annual Financial Report; and Water, Energy and Resource Conservation..

*Performance Measures & Results:*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
Number of sessions, number of people and type of workforce development activities conducted (e.g., trainings)	<p><b>Training hours per employee:</b> Average of 32 hours per year per employee;</p> <p><b>WW Operator Certification coverage (%):</b> IWTP Operators License/# Required (29/1) x 100 = 2900%;</p> <p><b>WW Operator Certification % of Total Operators:</b> IWTP Operators with License/Total # Operators (29/49) x 100 = 59.2%;</p>
Level of employee engagement in the goals and vision of the Utility of the Future business model	<p><b>100%.</b> Each employee is asked to state their individual goals and objectives annually; to identify training that would allow them to improve personal and plant performance; and to identify specific organizational or operational changes and management team assistance that would make them or the operations more effective;</p>
Number of open positions that internal candidates can qualify for, as a result of employee training and enrichment programs	<p><b>100% within Career Ladder:</b></p> <ul style="list-style-type: none"> <li>UOSA has established career ladders for employees in the following areas of the plant: Laboratory; Information Management Section; Capital Improvement Section; Operation &amp; Maintenance Division; and Treatment Process Division. These unique career ladders provide a mechanism for staff to chart a path to develop their skills and knowledge and to be fairly compensated as their</li> </ul>

	knowledge and responsibility grows, and as they earn professional licenses and certifications.
Resource efficiency improvements related to staff utilization	<p><b>Employee Retention and Satisfaction:</b></p> <ul style="list-style-type: none"> <li>• 2015 Voluntary turnover: 1.0%</li> <li>• 2015 Retirement turnover: 3.0%</li> <li>• 2015 Experience turnover: 5.0%</li> </ul> <p><b>Workforce Succession Preparation:</b></p> <ul style="list-style-type: none"> <li>• Key position vacancies: average time vacant: 40 days</li> <li>• Key position internal/external recruitment (%): 40%/60%</li> <li>• Long term succession plan coverage: 10%</li> </ul>
Examples where employees and stakeholders have made the necessary modifications within their control and capabilities	<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• UOSA has placed employees in leadership roles on a trial basis. This gives the employee some experience leading and allows senior management to assess their readiness for future permanent placement.</li> <li>• UOSA’s Sustainability Team and Sustainability Policy were the vision of UOSA employees and was organically formed and drafted by the employees before being adopted and officially endorsed by UOSA’s Executive Management.</li> </ul>

**ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- ‘Energy teams’ established and individuals empowered within the utility for energy efficiency activities (e.g., an “energy advocate” or “energy champion”)
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

UOSA has established employee performance plans that include energy program-related activities to support the utility’s energy vision and goals where appropriate.

UOSA has a Sustainability Policy and a Fiscal Sustainability Plan that includes water, resource and energy efficiency master plans. UOSA’s internal communications strategy includes direct team member communication; intranet postings and alerts; team meetings; progress reports; and incentive awards.

UOSA has established a Sustainability Team and O&M energy efficiency personnel that are empowered to implement the Sustainability Plan elements and communicate results to management and staff.

Internal incentives are in place for achieving energy efficiency goals. UOSA uses its Rewards/Incentive Program Policy to recognize an employee or groups of employees for extraordinary service to UOSA which includes achieving and/or establishing energy efficiencies.

As required by UOSA’s Sustainability Policy, energy efficiency is evaluated for all equipment purchases and capital projects.

UOSA utilized an energy performance contract to identify, evaluate and install various energy conservation measures throughout the site that included: combined heat & power electrical generation using biogas; aeration basin high efficiency turbo blowers; and site wide lighting improvements.

UOSA actively participates in numerous WERF, WRRF, WRF and other research activities and projects; Active/Open (9); Pending Award (6); Closed (2); and Not Awarded (5).

Power and fuel sub-metering is installed and monitored for critical process units at the building, sub-building and specific equipment level (Ex. aeration blowers, pumps, biosolids pelletizers; scrubbers, CH&P unit, boilers, etc.)

Utilization of energy conserving equipment wherever possible (e.g., utilization of peak shaving equipment to reduce usage). UOSA operates three emergency generators for emergency power back-up and for peak shaving purposes.

Installation of ultra-high efficiency turbo blowers for aeration.

Retrofit of site lighting with high efficiency lamps, ballasts and occupancy sensors.

Use of flow equalization to spread/distribute peak flows, conserve energy and to reduce power costs.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>KWh reductions in site energy use/intensity – to date or anticipated in the future (e.g., change in energy required per million gallons treated, or change in energy required per hour of pump operation)</i>	38% reduction kWh/MG since 2005. 27% reduction kWh/MG since 2010. FY-11 3409 kWh/MG FY-12 3363 kWh/MG FY-13 3247 kWh/MG FY-14 2623 kWh/MG FY-15 2652 kWh/MG FY-16 2472 kWh/MG
<i>Translation of energy use/intensity reductions to greenhouse gas emission reductions – to date and anticipated in the future</i>	To Date: 55,785 tons since 2005. Ongoing: 12,000 tons per year.
<i>Current and anticipated investment (in USD) in energy efficiency projects or activities, and anticipated savings (in USD)</i>	Current Investment: \$6,900,000 Savings Since 2005: \$4,956,547
<i>Electrical and natural gas sub-metering is conducted for critical process units</i>	Sub-metering is provided in all buildings and in critical process units such as CHPCU, turbo blowers used for aeration, rotary pelletizers, pumps, lighting, and HVAC.
<i>Utilization of peak shaving equipment to reduce usage and costs (Hrs/Yr; \$/Yr)</i>	Typical Utilization: 200-400 gen-hrs per year Typical Savings: \$90-\$130K per year FY-16 Savings: \$92K
<i>Reduce Chemical Sludge to Landfill (Yds/MG)</i>	FY-11 669 Cubic Yards/MG FY-12 496 Cubic Yards/MG FY-13 605 Cubic Yards/MG FY-14 292 Cubic Yards/MG FY-15 511 Cubic Yards/MG
<i>Reduce Amount of Land Applied Class B Biosolids</i>	Reduced 95% since 2005
<i>Increase Amount of Land Applied Class A EQ Biosolids</i>	Increased 531% since 2005
<i>Decrease Chemical Use and Chemical Cost (\$/MG)</i>	Reduced \$59.42/MG since 2006; Represents a 31% reduction in chemical costs (\$/MG).



## ENERGY GENERATION & RECOVERY

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

UOSA has septage and FOG receiving stations in place

A combined heat and power cogeneration unit has been installed to generate electricity and recover heat to preheat anaerobic digester feed stream.

UOSA's Executive Management has established a Sustainability Policy and sponsored a Sustainability Team

UOSA's Executive Management has published a Fiscal Sustainability Plan

### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Reduced non-renewable energy use and carbon footprint (e.g., percent of non-renewable energy use reduction, percent of greenhouse gas emissions reduction)	Reduced non-renewable energy use by 38% since 2005; Reduced carbon footprint (CO <sub>2</sub> <sub>equiv</sub> ) by 27% since 2005; See previous Section
Reduced reliance on the power grid (e.g., percent reduction of energy utilization coming from the grid), and corresponding reduced vulnerability to climate change and energy price fluctuations	38% reduction since 2005; See previous Section
Cost savings (avoided energy costs)	\$4,956,547 since 2005
Sequestering quantifiable amounts of carbon	CO <sub>2</sub> <sub>equiv</sub> emissions have been reduced by 55,785 tons since 2005
Percent of total plant power demand that is generated on-site from renewable sources	CHPCU produces about 17% of the total plant power requirements from renewable biogas.

## VCS Denmark



WATER  
PRESERVATION'S  
UTILITY OF THE  
FUTURE  
TODAY

### VCS Denmark

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:



Organizational Culture



Energy Generation & Recovery

Utility Description (combine all plants if a multi-site system)		
Type: VCS Denmark provides drinking water, wastewater collection and treatment. Established in 1853 as first modern waterworks in Denmark. 3rd largest Danish water and wastewater company, Headquartered in Odense. Operates 7 water treatment plants and 8 wastewater treatment plants (WWTPs) with 2,125 miles (3,400 km) of conveyance.		
Service Area (square miles): 286	Average annual daily flow (MGD): 30	
Population Served: 450,000		
Location		
Street Address: Vandværksvej 7D		
City: Odense	Country: Denmark	Zip Code: 5000
Contact Information		
Name: Per Henrik Nielsen	Phone: +45 29 69 24 23	Email: phn@vandcenter.dk

## **NARRATIVE: VCS DENMARK: PAVING THE WAY FOR NEW WAYS OF THINKING ABOUT THE ENERGY/WATER NEXUS**

With the right organizational culture and modern technologies, it is now possible to think of wastewater treatment as a source of energy – rather than an energy consuming process. This is the philosophy at VCS Denmark's, where focused determination by committed, empowered, and engaged staff to examine all processes involved has produced a result that significantly exceeds the utilities goal of energy-neutrality

In 2015, our largest treatment facility, the Ejby Mølle Wastewater Treatment Plant (WWTP), reached an important landmark. Measured in kWh, Ejby Mølle WWTP produced more than 150 % of the energy it consumed,. The result was achieved with already existing technologies – by simply changing the mindset and empowering our staff to think differently and act boldly.

### **VCS Denmark: Our Organizational Culture**

VCS Denmark - VandCenter Syd - is the third largest water and wastewater utility in Denmark, and our history as an enterprise dates back more than 160 years. We are a limited company owned by two municipalities. This means we have special responsibilities and collaborate closely with the local authorities. We are known as a frontrunner within the sector.

Our main operational activities include catchment, treatment and distribution of potable water and wastewater transport, treatment and disposal – and in recent years our activities have increasingly incorporated climate adaptation as well. We contribute to the protection and improvement of the aquatic environment and the development of green urban living.

We share our knowledge and know-how with Danish and international partners. Our vision is to become a role model – locally, nationally and internationally. Our actions are shaped by our core values: responsibility; commitment; innovation and professionalism; loyalty and humour.

We see ourselves as a part of a global world. We have a global mindset, both when it comes to our lasting footprint in the world - and when it comes to our dependence on others to achieve the best possible results. To us, being a responsible company is a fundamental strategic principle. We have committed ourselves to actively support the Sustainable Development Goals (SDGs) set out by the United Nations, as well as the United Nations Global Compact principles. In the near future we will align our business strategy with the SDGs, and, if needed, implement new elements defined in the SDGs into our corporate strategy.

For years, VCS Denmark has put a strong emphasis on being a responsible company and we report our efforts on Corporate Social Responsibility annually. Publishing of these reports is one of the items we highlight in this application. In 2016, we focus on the concept of sustainability and how we can incorporate this in our organization and in the contracts that we sign with contractors and subcontractors.

Whether you call it SDGs, sustainability or responsibility, the challenges are akin: for VCS Denmark, it is all about how to act responsibly as a water and wastewater utility in terms of our impact, both locally and globally. We have to secure a future supply, take care of the environment, look out for our staff and recover resources from wastewater. As a publicly owned utility, we also believe that we have a

particular obligation to share our know-how since issues such as resource scarcity, climate adaptation and mitigation of climate change all constitute global challenges....which we believe are essential elements of a Utility of the Future.

Finding ways to improve our energy profile and reduce our carbon footprint

Our journey towards recovering energy resources in the wastewater began in 2010. At that point, VCS Denmark decided to challenge the paradigm of major wastewater treatment plants by becoming energy neutral by 2014, and we put out an international tender asking for inspiration to achieve this goal. Our collaborative project with a global consultancy led to a quantified catalogue of potential energy savings, and more importantly - a number of potential improvements in energy production. The Ejby Mølle WWTP (our largest facility with a capacity of 385,000 population equivalents) already had biogas driven combined heat power (CHP) facilities producing electricity and heating for our district heating system, but we wanted to go further. Our improvement program was in line with a general approach in Denmark and in our local community that green solutions are considered to be of high value.

#### Focusing on recovering energy resources

The basic approach was to identify energy resources in the wastewater. The more carbon that goes into the digester the higher the production of biogas. We evaluated the carbon-balance throughout the treatment processes with the objective of optimizing the utilization of the received organic material, while reducing its impact to the existing biological nutrient removal process in the liquid stream. By concentrating in carbon redirection, we were able to go from 75% energy self-sufficiency in 2011 to energy neutral by the end of 2014.

In addition to our process optimization program, one of innovative concepts we adopted was the treatment of the sidestream from digested sludge dewatering with the deammonification process, and its configuration to allow its implementation in the mainstream of our biological nutrient removal process as well. The general idea is to focus on elements such as carbon and ammonia, and make sure that they are handled in the most optimal way - whether for the purpose of removal or utilization. The result has been a process optimization containing many elements of improvement – many of them interrelated. By 2015 the Ejby Mølle WWTP became net energy producing by producing in terms of electrical and heat energy over 150% of what it requires to operate meeting very stringent nutrient removal requirements (TN < 5 mg/L; TP < 0.5 mg/L).

#### Holistic approach towards system-wide optimization

Our results are the sum of many initiatives – major as well as minor. E.g. we reduced the amount of oxygen used in the aeration process substantially through online measuring – thereby saving both energy and maintenance of our equipment. We also found that the mixing of the digester could be reduced to 6 hours daily – instead of having the mixer equipment operating 24 hours a day to produce the same amount of biogas.

For VCS Denmark, acting sustainably in a broader sense is an important part of the reason that we perceive wastewater as a resource. Many of the minor improvements in producing biogas are – as yet – mainly important from an environmental perspective. However, we choose to implement them nonetheless.

We will continue to focus on improving our performance. From 2016 and onwards, some of key focus areas include process intensification through sludge granulation (We are part of a WERF research project looking into this) reducing GHG emissions (nitrous oxide) and ensuring that we have the right kind of biomass efficiently removing nutrients before discharging our effluent to the Odense river (mainstream deammonification).

#### Our contribution to the water industry

Our Ejby Mølle WWTP has managed to become a net energy producing plant as one of the first plants of its kind in the world - without the adding of external carbon. The offset was a well-functioning plant, but even facilities of other standards will be able to achieve significant results – simply by using what they have, in a more efficient way. The investments required at Ejby Mølle WWTP have been relatively minor. Overall, results have been achieved by changing the mindset of our staff, learning from the experiences of others, and making the most of the resources already at hand. Focusing on energy production will therefore be sustainable from an economic point of view for very many wastewater treatment plants.

#### **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee “in-reach” program established to share work experiences and ensure greater understanding of the utility’s key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

We publish a yearly Corporate Social Responsibility (CSR) report focusing on what our challenges are and how we act as a responsible company in our day to day activities meeting the demands of a 21st century water utility as a corporate citizen of Denmark and of the world. Our target audiences are both internal (staff) and external (the community we serve in Odense) customers, as well as the Danish society as a whole. Our CSRs are also translated to English and are posted on our webpage in the hope of reaching other readers around the world.

Our R&D program aims at developing the innovative solutions we and the water industry need to deal sustainably with the significant challenges that the future will bring. As a testament to our commitment, we dedicate an average 1% of our annual gross turnover to sustain this effort. Topics currently being investigated include energy optimization in “used” water reclamation, carbon redirection, resource recovery, low-maintenance and simpler process control instrumentation, GHG emissions monitoring and control, intensification of nutrient removal processes, groundwater source protection, and climate change adaptation strategies.

Our technology optimization outreach program has for 2016 secured 16 opportunities for disseminating our industry contributions, by being part of major technical programs in events such as WEFTEC, IWA’s Leading Edge Technology Conference, Singapore International Water Week, and IWA’s World Water Congress.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Level of employee engagement in the goals and vision of the Utility of the Future business model</i>	Through our ongoing internal surveying efforts, we have documented that 89% of our employees understand, feel proud and support our strategic goals and related activities in being a local and global relevant organization.
<i>Support of Staff development through focused training programs</i>	VCS has a broad range of different training activities internally in our company. Almost 95% of our staff was actively involved in training and competence enhancement last year and the average time per employee spend on training was exceeding 50 hours
<i>Level of global engagement by our staff</i>	We participated in technology knowledge sharing and institutional capacity building activities in the following countries: USA, Russia, Bangladesh, Vietnam, Indonesia, Malaysia, Singapore and South Africa.

**ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

In 2010, VCS adopted the goal of becoming CO2 neutral by 2014 and by 2013, the Ejby Mølle WWTP (at 385,000 population equivalent capacity, the VCS largest facility) was already energy self-sufficient able to meet its very stringent nutrient removal goals. This was accomplished by reducing energy consumption (primarily from the biological nutrient removal processes by optimizing simultaneous nitrification/denitrification) and by redirecting carbon from primary treatment to the anaerobic digestion/combined heat power system for both electrical and heat energy generation and recovery.

Since 2015, the plant has become a net energy producer (150% of energy requirements), both in terms of electrical power generation and excess heat recovery which is being used in a district heating system serving the community around the treatment plant. The main contributions to this significant conversion was the adoption of a sidestream deammonification system that was configured with mainstream deammonification conversion capabilities. This capability, which is currently in start-up mode, will further efforts of decreasing energy consumption and increasing energy generation at the plant.

VCS is collaborating with WERF in an international study aimed at process intensification through the inducement of granulation of the biomass in its BNR reactors. The hydrocyclones that make part of the mainstream deammonification capabilities assist in keeping heavier biomass fractions within the process, while wasting lighter fractions. Results to date are very encouraging, showing significant improvement in biomass settling characteristics

VCS is in the process of retrofitting the oxidation ditch of another of its smaller BNR facilities to be able to optimize oxygen transfer by combining fine bubble membrane panels, surface aerators and slow speed horizontal mixers. If successful, this system will be retrofitted into the larger Ejby Mølle facility.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Achieve corporate goal of energy self-sufficiency by 2014</i>	The Ejby Mølle WWTP achieved energy-neutrality by end of 2013 by leveraging carbon redirection in order to reduce process energy consumption while increasing energy generation from a biogas driven combine heat power system.
<i>Further improve energy profile</i>	The Ejby Mølle WWTP is currently generating over 150% of its energy demand as the result of adopting sidestream and mainstream deammonification capabilities.
<i>Process Intensification</i>	Inducement of biomass granulation through the use of hydrocyclones has improved sludge settleability, as measured by the reduction of average sludge volume index values in excess of 40%. This will further increase the energy efficiency of the facility by reducing facility and operational requirements of nutrient removal.
<i>Be recognized for contribution to the water industry's knowledge base</i>	Energy optimization efforts were recognized by receiving the WEX Process Optimization award during the 2013 Water and Energy Exchange conference in Madrid (Spain).

## Victor Valley Wastewater Reclamation Authority CA



WATER  
RESOURCES  
UTILITY OF  
THE  
FUTURE  
TODAY

### Victor Valley Wastewater Reclamation Authority (VWVRA) CA

#### Utility of the Future Today Activity Areas Meeting Criteria for Recognition:

- ★ Organizational Culture
- ★ Energy Efficiency
- ★ Energy Generation & Recovery
- ★ Water Reuse

Utility Description (combine all plants if a multi-site system)		
Victor Valley Wastewater Reclamation Authority (VWVRA) Victorville, CA		
Type: Regional plant		
Service Area (square miles): 223 sq. miles	Average annual daily flow (MGD): 10.72 mgd	
Population Served: 300,000+		
Location		
Street Address: 20111 Shay Road		
City: Victorville	State: CA	Zip Code: 92394
Contact Information		
Name: David Wylie	Phone: (760) 523-1781	Email: dwylie@vwvra



## **NARRATIVE: Organizational Culture at VVWRA**

The cornerstones of the organizational culture at the Victor Valley Wastewater Reclamation Authority are four rules instituted by General Manager Logan Olds. “Logan’s Rules” are 1) Treat the wastewater to the best means possible given the resources available, 2) Provide resources to do number one, 3) Manage liability, and 4) Do not confuse managerial with governing authority. While these rules were originally intended to guide employees in the wastewater treatment process, VVWRA has expanded its mission to become an environmentally sustainable resource recovery facility.

Energy efficiency is a key to being an environmentally sustainable resource recovery facility. VVWRA has actively pursued grants for programs and processes that reduce energy consumption while generating green sustainable electricity. To date the Authority has received two CEC grants, along with awards from the DOE and NACWA for our efforts to innovate. VVWRA management has established policies that make energy efficiency a priority. UV disinfection is an energy demanding process, but the VVWRA operations team has developed a protocol that dramatically reduces the amount of power needed to meet the needs of the plant. The protocol not only lowers energy usage, but reduces wear and tear on expensive equipment. VVWRA employees are provided training in practices that help maximize energy efficiency at the plant and are currently part of the DOE Superior Energy Performance program to obtain ISO 50001 certification. The ISO 50001 program gives our staff guidelines for mapping energy usage at the plant and strategies for reducing electricity consumption while reducing carbon emissions. The program gives our staff an active voice in addressing and resolving energy issues.

While energy efficiency is important, VVWRA management has made energy generation and resource recovery a priority. The two concepts work hand in hand. One of the resources VVWRA recovers is naturally occurring methane or biogas. Through its Waste to Energy program and a Public/Private energy agreement, VVWRA is capturing the biogas, scrubbing it and using it to power a pair of 800kwh generators to produce enough electricity to meet more than 90% of the plants energy needs. The ultimate goal is to become completely energy neutral. VVWRA management is leading the way towards that goal with continued support of the Waste to Energy program, including a \$1.7 million dollar grant for a new micro-grid and battery storage system that is expected to be installed in late 2016. The planned upgrades will assure a consistent and reliable energy source. This fits with Rule #2 of “Logan’s Rule’s” by providing the resources needed to complete the VVWRA mission. In addition, VVWRA and California State Assemblyman Jay Obernolte are co-sponsoring Assembly Bill 1773 in the California legislature. AB 1773 will clear current legal barriers so VVWRA can build a solar farm on a portion of its 440 acre property to offset electricity to be used by a pair of water reclamation plants currently under construction. The legislation will further VVWRA’s efforts at becoming 100% energy neutral.

Another source of resource recovery at VVWRA is water recycling and water reuse. VVWRA’s main plant in Victorville, CA recycles about 10.5 million gallons of water per day. The Title 22 recycled water is returned to the Mojave River Basin to help recharge the aquifer. VVWRA’s service area and surrounding communities are entirely reliant on groundwater supplies. VVWRA’s water recycling efforts create a reliable supplement to the downstream water supply. Recycled water from VVWRA is also used in the cooling towers at a nearby power plant. In addition, two water reclamation facilities currently under construction in Apple Valley, CA and Hesperia, CA will provide each of those communities with one

million gallons of recycled water per day. When the new plants come on line in mid-2017, the water will be used for above ground irrigation at golf courses, civic centers and parks.

VVWRA's efforts in energy efficiency, energy generation, resource recovery and water reuse have culminated in a unique project. Currently the Authority has issued a request for proposals to privatize three anaerobic digesters. The goals are to reuse more of the biogas, that is currently flared, to produce renewable carbon neutral power for export to the electrical grid. Thereby, meeting both onsite electrical demand, as well as enabling the export of electrical power. The equipment will utilize recycled water onsite for cooling and the waste heat will be used for drying biosolids and/or producing a liquid commercial fertilizer product. Several private companies have expressed interest in the opportunity to co-locate and utilize public infrastructure to process their anaerobically digestible material.

The organizational culture and managerial direction at VVWRA is key to accomplishing its goals in energy efficiency, energy generation, resource recovery and water reuse. VVWRA management has made success in these key areas a priority and it begins with "Logan's Rules". The VVWRA organizational culture has created a team approach to tackling these complex issues and processes. That approach helps create an atmosphere where staff is part of the planning and implementation process, which gives them ownership in the plants overall achievements.

## **ORGANIZATIONAL CULTURE**

- Proactive leadership that engages in both internal organizational and broader external community priorities
- Establishes a participatory, collaborative organization dedicated to continual learning, improvement, and innovation
- Workforce and leadership development program in place to assure recruitment, retention, and competency of utility staff relative to a Utility of the Future business model. Development program includes a leadership and management skills training program that provides both formal and informal leadership opportunities for employees
- Employee "in-reach" program established to share work experiences and ensure greater understanding of the utility's key strategy relative to the Utility of the Future business model
- Innovation initiatives adopted that encourage risk-taking, and that are adequately funded and staffed

VVWRA was the first wastewater facility to join the Department of Energy's Better Plants program. In 2016, VVWRA won the Better Plants Challenge by reducing energy consumption by 27%.

VVWRA has been a community partner. Our internship program with Victor Valley College has been a tremendous success. 17 current full time employees have gone through the VVC internship program. In addition, VVWRA hosts a SCADA mentorship program with students at Granite Hills High School in Apple Valley, CA.

VVWRA has partnered with our local water wholesaler, Mojave Water Agency, state regulator Lahontan Regional Water Quality Control Board, Bureau of Reclamation, PG & E, and the Mojave Desert Resource Conservation District to develop a watershed permitting process to include nutrient trading.

### *Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
Board engagement in Public Private Partnerships	<ol style="list-style-type: none"> <li>VVWRA Board adopted an environmentally sustainable ethos resolution to guide future operations.</li> <li>VVWRA Board approved a Power Purchase Agreement (PPA) with Anaergia Inc. for power production as part of the goal to become energy neutral.</li> </ol>
Energy neutrality	<ol style="list-style-type: none"> <li>VVWRA managed to produce 93% of its electrical needs in March of 2016.</li> <li>VVWRA has been awarded a California Energy Commission grant for a battery storage and micro-grid project.</li> </ol>
Staff involvement with energy reduction	Staff has currently completed 50% of the Department of Energy's Super Energy Program training for ISO 50001. This program is intended to meet two goals; 1) monitor existing energy use; 2) identify areas to improve energy efficiency in a standardized, multi-industrial format.
Community engagement	<ol style="list-style-type: none"> <li>VVWRA has an active internship program with Victor Valley College. 17 current VVWRA employees have gone through the program.</li> <li>VVWRA has a SCADA mentorship program with students from Granite Hills High School in Apple Valley, CA.</li> </ol>
Success in energy savings, green production and innovative operations	<ol style="list-style-type: none"> <li>VVWRA has won numerous awards, including the NACWA award for Environmental Performance, for its different programs, including the waste to energy program.</li> </ol>

**ENERGY EFFICIENCY**

- Indication of management commitment (e.g., energy efficiency standard operating procedures; board/executive management energy efficiency policy, including quantitative goals developed and shared with stakeholders)
- Energy audit/benchmarking conducted to identify priorities for energy efficiency improvements
- 'Energy teams' established and individuals empowered within the utility for energy efficiency activities (e.g., an "energy advocate" or "energy champion")
- Energy management-related training provided to plant staff
- Utilization of energy conserving operational methods (e.g., optimization of primary sedimentation to reduce utilization of pure oxygen)

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>US Department of Energy's Better Plants program</i>	US Department of Energy shows that VVWRA has reduced its energy use by 27%.
<i>Partnerships with Southern California Edison</i>	<ol style="list-style-type: none"> <li>Performance reports for our Piller blowers</li> <li>SCE documents certifying energy efficiency achievement's.</li> </ol>
Energy audit	<ol style="list-style-type: none"> <li>UC San Diego, with the help of an EPA grant, performed an energy audit of our operations. The recommended 6 energy improvements that could save \$575,000 annually. Most of these recommendations have been implemented.</li> </ol>

Superior energy performance (SEP) team	1. An SEP team made up of VVWRA employees is establishing an energy policy and is working on ISO 50001 accreditation.
SEP training	SEP training matrix established.
Aeration energy efficiency project	In order to be eligible for Southern California Edison's (SCE) on bill financing program (OBF), the cost savings must be recouped within a 3 to 4 year period. Those funds are used to repay the loan for the aeration efficiency project. Therefore, the project has a net zero financial impact on VVWRA.

**ENERGY GENERATION & RECOVERY**

- Indication of management commitment (e.g., standard operating procedures; board/executive management renewable energy conversion policy, including quantitative goals developed and shared with stakeholders)
- Internal energy sources evaluated (e.g., biogas, hydropower, heat in wastewater), and/or renewable energy sources evaluated on an ongoing basis (e.g., solar, wind, co-digestion)
- Recovery of digester gas in a combined heat and power (CHP) system, and boilers in place (for process and building heating)
- Conversion of digester biogas to electricity and heat, and/or transportation fuel Yes
- Solar panels, wind turbines, heat recovery, in conduit hydro, and/or hydroelectric power generation systems installed

VVWRA has issued an RFP to privatize a portion of the facility for power production. The infrastructure being offered includes three small digesters that could be used to produce biogas.

*Performance Measures & Results*

Your Performance Measure(s)	Your Results (quantitative or qualitative)
VVWRA Board, management and community commitment	VVWRA entered into a Power Purchase Agreement (PPA) with the private company Anaergia Inc. for low cost electricity over the next 20 years.
Evaluate solar energy viability	A preliminary study was conducted showing solar energy is viable at VVWRA.
Work with local lawmaker to allow JPA's to take part in RES-BCT program which allows energy credits. Current law does not allow JPA's to participate in the program.	VVWRA has worked with Assemblyman Jay Obernolte to draft California state legislation (AB 1773) that would allow JPA's like VVWRA to take part in RES-BCT program. Bill currently making its way through the California legislature.

**WATER REUSE**

- Board/executive management reuse strategy established
- Communications and outreach plan developed and implemented

- Ongoing market assessment of reused water to public/private and public/public entities
- Investments in reuse infrastructure
- Building code changes to enable reuse (e.g., reuse water code)

VVWRA is among the first plants in the world to use fibrecast membrane filtering technology.

VVWRA is building two identical water reclamation facilities with the same influent characteristics that can be used for performance testing of water reuse technology for direct potable reuse and indirect potable reuse.

*Performance Measures & Results*

<b>Your Performance Measure(s)</b>	<b>Your Results (quantitative or qualitative)</b>
<i>Establish a strategy for water reuse and energy for the future</i>	The VVWRA Board adopted an environmentally sustainable ethos resolution establishing guidelines for the operation and maintenance of facilities and projects.
<i>Community outreach for new projects</i>	VVWRA completed extensive community outreach and education about the subregional water recycling facilities in Apple Valley and Hesperia before construction began.
Assessing water reuse market	VVWRA completed water reuse agreements with Hesperia and Apple Valley.
Investment in infrastructure	VVWRA is investing about \$80 million in design and construction of two 1MGD subregional water recycling facilities in Apple Valley and Hesperia.
Code and building changes to enable reuse	VVWRA has established a general recycled water permit that will enable local code development for water reuse projects.

## 2017 Utility of the Future Information

### Eligible Applicants

- Public and private wastewater collection and/or treatment systems (water resource recovery facilities) of all sizes. *Wastewater treatment plants that treat stormwater are eligible to apply, but would not be assessed only on the basis of their stormwater operations.*
- Applicants must have no major permit violations in the past year prior to the submission date of their application.

### Basis for Recognition

Successful applicants have demonstrated that they are engaged in developing and growing an Organizational Culture that supports Utility of the Future implementation, as well as at least one selected Activity Area in a meaningful and robust manner, consistent with the principles of the Utility of the Future.

### Application Requirements

To be considered for recognition, applicants must submit the following written materials. Each are described further in this information:

- **Application Part 1:** Background Information
- **Application Part 2:** *Utility of the Future Today* Organizational Culture Narrative
- **Application Part 3:** *Utility of the Future Today* Activity Area Description
- **Application Part 4:** Signed certification statement

### Presentation of Recognition

A ceremony will be held at WEFTEC in Chicago, Illinois on October 3, 2017 to celebrate recognition recipients. Applicants are not required to attend WEFTEC to receive recognition. Selected utilities will receive a Utility of the Future Today flag to proudly hang/fly as well as a certificate.

### Recognition Renewal Process

Utility of the Future Today recognition is granted for a three-year period – this applies to both the Organizational Culture narrative and recognition, as well as the additional Activity Area.

After three years, program members must renew their recognition. The applicant will need to: 1) show advancements in Organizational Culture, and 2) either show advancement in a previously recognized Activity Area, or apply in a new Activity Area.

Beginning in 2018, program members will be invited (but not required) to submit up to one additional Activity Area annually to receive further recognition.

Sponsoring organizations reserve the right to withdraw recognition from any previously selected applicant at any time.

## Questions?

[UtilityRecognition@wef.org](mailto:UtilityRecognition@wef.org)