
Strategic Plan for the Utilities Department Town of Edisto Beach

This document sets out a detailed strategic plan for the Edisto Beach Utilities Department. It reviews the external environment (opportunities and challenges) and internal environment (assets and limitations); presents a series of statements relating to the Town of Edisto Beach's vision, mission, mandates, strategic issues, values and objectives; and sets out its proposed strategies and goals for organizational implementation and achievement.

Executive Summary

This is the Strategic Plan for the Edisto Beach Utilities Department. It contains an executive summary of the Department. This document contains program mandates, strategic issues, and strategies to improve efficiency and effectiveness throughout the Department. This document is intended to be dynamic and accessible to all employees within the Department who are encouraged to review and revise the plan. Although revisions can be made at any time, it will be emphasized that the plan be reviewed and updated at least annually. Goal successes will be documented in the executive summary.

The structure of the strategic plan is based upon *Strategic Planning for Public and Nonprofit Organizations* by John M. Bryson (3rd edition, 2004).

WHERE ARE WE NOW?

Departmental Historical Overview

As staffs leave the Town, historical data and information are often lost. This section provides an overview of significant changes and/or events that have affected the Edisto Beach Utilities Department. If information was available regarding the reason the changes occurred, this information was also included.

The Edisto Beach Utilities Department, in its current form, was established in or around 1976. The Town purchased 2 privately owned water companies--- the Water Company of Edisto Beach and the Jungle Shores Water Company. The Water Company of Edisto Beach consisted of one 6 inch well that was drilled in 1962, was 420 feet deep and delivered 130 gallons per minute. The system also included a 100,000 gallon elevated storage tank. The distribution system consisted of approximately 1,200 feet of 10 inch diameter asbestos cement pipe, 14,160 feet of 8 inch asbestos cement pipe, 640 feet of 3 inch Poly vinyl chloride pipe, 14 fire hydrants and 228 metered service connections.

The Jungle Shores Water Company was supplied by two 4 inch wells that produced 50 gallons of water per minute each. Both 4 inch wells were drilled in 1954. A pneumatic tank located at both wells served as equalizing storage. The distribution system consisted of 12,600 feet of 6 inch pipe, 1,100 feet of 2 inch pipe, 2 fire hydrants and 16 metered services.

There was also documentation that indicated the Town possibly entered into an agreement with Ruscon Corporation and Sea Island Resorts, Inc. to transfer ownership of their water and sewer system to the Town and for them to operate and maintain in exchange for water and sewer service to the development. It also appears that the Town funded, through the purchase of the two water companies a water line improvement project to connect the two utility companies and extend the lines further in the Town.

The Town has a 100,000 gallon elevated storage tank that is supplied by 4 wells and 2 booster pumps. The town also has a 200,000 gallon ground storage tank and 2 wells that help meet fluctuating water demand promulgated by the tourist population. The demand for water in 2013 fluctuates from 350,000 per day to 1.4 million gallons per day. The Town can pump 1,600 gallons per minute. The Town is permitted through DHEC to extract 256,000,000 gallons per year from the 6 total wells. Legally, we are allowed to pump 1,717,200 gallons in an 18 hour cycle.

The Town's water system consists of 138,516 linear feet or 28.23 miles of pipe. Pipe widths vary and range from 10 inch water main (7,336 feet), 8 inch water mains (39,108 feet), 6 inch water main (56,872 feet), to 2 and 3 inch water lines (35,200 feet). The Point Street Water Expansion project was completed in 2013 which added 5,380 linear feet of water line and 6 fire hydrants. Jungle Shores Water Line expansion project is being permitted and expected to be completed in 2016. This will add another 5,370 linear feet of water line and 11 fire hydrants.

Two additional wells are located on the beach, one known as the Oristo well and the other located under the elevated storage tank (Permit No. 25449 dated March 23, 1979). Neither are in use for public water supply per correspondence dated June 19, 1980, from Marshall Dixon, DHEC, "both the Oristo well and the well under the elevated storage tank are less than 100 feet from a source of pollution and I do not recommend the use of these wells as a public water supply". The Oristo well is located next to a wastewater holding pond and the well under the elevated storage tank is located near diesel fuel contamination from the Oristo maintenance shop. Both are privately owned. In 2012, Plantation Golf permitted two additional wells for irrigation. Water supply and water quality are being evaluated by Wharton Smith and they are scheduled to propose improvements to the Council in 2016.

The wastewater treatment facility on Edisto Beach was constructed in 1986. Funding was provided through a HUD Community Development Grant and private developers in the Town (Fairfield Ocean Ridge and Marian Associates). The facility consists of an influent static screen, a multi-celled dual power level aerated lagoon consisting of one (1) complete mixed cell, three (3) partially mixed cells, and one (1) settling cell. Following the aerated lagoon, the effluent is disinfected via gaseous chlorination and routed through a "V" notch weir for flow measurement to an effluent holding pond. From the effluent holding pond, the water is used for irrigation of the Fairfield Ocean Ridge golf course.

The Town has 13 lift stations at various locations on the beach. All are pumped via force mains to the wastewater treatment facility located at 2417 Holmes Street. The wastewater facility is a biological aerated lagoon. Microorganisms digest the waste and the effluent is treated with chlorine and used by Plantation Golf course for irrigation. The sewer system's total length of force mains is 23,175 linear feet or 4.38 miles. Of this total, there are 17,275 feet of 4" force mains and 5,900 feet of 6 inch force mains. The total length of gravity sewer lines extends 47,999 feet or 9.09 miles. Of this total, there are 3,160 feet of 10 inch gravity mains and 44,839 feet of 8 inch gravity mains. The system contains 269 man holes for servicing. The wastewater system is permitted to treat 350,000 gallons per day. Current usage is at 84% capacity.

In 2014, Council placed a moratorium on sewer connections on the Scott Creek/Docksite Road system which has exceeded its permitted capacity. A study was performed by URS/AECOM to determine how to correct issues with Lift Station B and several issues are being reviewed such as an air relief valve at the Golf Course.

The Town currently services 2,301 residential water customers, 79 irrigation water customers and 1,041 sewer customers.

Staff in this department are cross trained in water and wastewater. Most have multiple licenses (biological wastewater treatment, water treatment, water distribution, wastewater collection and distribution). Included in these functions is construction and repair of water and wastewater lines as well as, troubleshooting and repair of well pumps and submersible pumps. Along with these functions, all staff read meters twice annually and assist in mowing Town properties and rights of way.

During FY 2010-11, the following was accomplished.

- Installed new Variable Frequency Drive (VFD) to support new Booster Pump at well field
- Replaced Booster Pump #2 at well field with stainless pump and motor.
- Installed Variable Frequency Drive units on Lift Stations (A & C) to take the place of SCE&G's RONK phase converters.
- Installed radio communication system for SCADA to improve system operational capabilities.
- Lift Station and manhole rehabilitation Project to remove hydrogen sulfide damage and coat with two part epoxy.
- Installed 6" water main across Palmetto Blvd. at Eddings and Edisto Streets for future expansion of water service and fire protection on Point Street.
- Replaced valves Lee Street Lift Station
- Began treating waste water lagoon with BYO GON to remove sludge. This project was placed on hold because the sludge test showed no decrease in sludge volume
- Replaced gate valves and check valves at Summerwinds Lift Station.

During FY 2010-11, Lift Station B pumps failed because of sand infiltration damage. These pumps were replaced in July 2008 and were capitalized for a 20 year period. The problem was reviewed and the lift station was vacuumed out and one of the impellers was replaced. Also, the Variable Frequency Drive in Lift Station B was replaced.

During this period, staff also realized that the DHEC sewer tap ledger that is used to record all sewer taps and associated calculations could not be located. Upon re-creation of this document from property assessor information, it became evident that the Town had exceeded the 80% allowed wastewater volume usage and plans are being made to have a Preliminary Engineering report (PER) conducted. A Preliminary Engineering Report (PER) is required once 80% capacity has been exceeded and American Engineering has been contracted with to perform the study.

Current calculations (August 2011) indicate capacity is at 84%. Some technological changes have occurred in the past 5 years that staff feels has led to an accelerated usage schedule. More homes have installed whole house reverse osmosis systems which use more water than was specified for the calculated usage. In addition, two commercial ice machines were installed that use a large quantity of water resulting in associated reverse osmosis waste.

During FY 2011-12, the following was accomplished:

- Replaced well pump at Lion's club
- Performed lift station B manhole cover inspections
- Began jetting and televising utility
- Replaced pump at Bay Creek Lift Station
- Completed Inflow & Infiltration Study of Summerwind, A Basin, B Basin, C Basin and the Ridge and repaired breaches to the system
- Constructed control room and installed emergency generator. Moved telemetry system inside control room
- Reinstalled three monitoring wells on golf course
- Began Reverse Osmosis study
- Replaced lift station B pump and began annual maintenance program to pump out sand
- Discontinued the bioreduction project on wastewater pond and scheduled dredging of sludge.
- Refinanced the revenue bond at a cumulative savings of \$181,726. The Series 2012 bonds were negotiated for a 30 year term that closes in 2042. The amount of the Series 2012 bonds is \$1,616,607.30 with annual payments of \$69,662 and a principal payment of \$375,000 due every 5 years. The net interest is 3.2%. \$429,234 was placed in a construction fund to pay for capital improvements or maintenance to the water and sewer systems.

During FY 2012-13 the following was accomplished:

- Replaced/repaired Fat Jack's Lift Station pump
- WWTP sludge dredged over 100 tons
- Installed new 6" water line on Point Street with 6 fire hydrants
- Replaced well pump and motor at Well #4 at Wellfield
- Replaced suction lines at Lift Station "A"
- Replaced 3 – 5HP aerators at WWTP
- SCRWA completed GIS/GPS locating of water and wastewater assets
- Conducted Wash-out inspections of elevated and ground storage tanks
- Replaced Lions Club Well
- Replaced control panel at Waterfront Lift Station

During FY 2013-14 the following was accomplished:

- Replaced 2 Variable Frequency Drives at Lift Station B
- Replaced 4” force main at Docksite Lift Station
- Replaced 2 check valves and rebuilt 2 check valves at Lift Station B
- All operators attended Asbestos training and received certification
- Replaced 1 pump at Scott Creek Lift Station
- Replaced 2 suction lines at Lift Station B
- Installed a new chlorinator at the Wastewater treatment plant which saves the Town approximately 8,000,000 gallons of water
- Digitized well logs, lift station logs and inventory
- All operators received training in wastewater collections and distribution and passed their “D” level license
- Replaced 2 pressure transducers on booster pumps at wellfield
- Installed new air conditioner unit for VFD control cabinet at wellfield
- Televised sewer lines Jungle Road, Scott Creek Drive and part of Lift Station B
- Evaluated permitted gallons per day against sewer connections

During FY 2014-15 the following was accomplished:

- Replaced 5 aerators at the wastewater treatment plant
- Replaced 2 pumps at Bay Point Lift Station
- Replaced one VFD at Lift Station “B”
- All operators attended Asbestos training and received certification
- 13 valve insertions were completed in the system
- Replaced 4 impellers and wear plates at lift stations “A” & “B”
- Replaced one 12.1 hp pump at Waterfront lift station
- Installed new static screen at the wastewater treatment plant
- Replaced 3 globe valves and 2 check valves at the Waterfront lift station
- Replaced 1 fire hydrant at Club Cottage
- Completed lab certifications
- One operator took and passed the “D” Biological wastewater and water distribution exam
- One operator took and passed the “C” Water distribution exam
- Replaced one 4.7 hp pump at Bay Creek Lift Station
- Conducted hydrant flow testing
- Received permit to construct Jungle Shores Water line Project

At the end of FY2013, staff began correlating the individual sewer permits to actual connections. It appears some of the systems have exceeded their permitted capacity. URS/AECOM is working on the Scott Creek/Docksite system to determine if this is the case and recommend how to correct the problem.

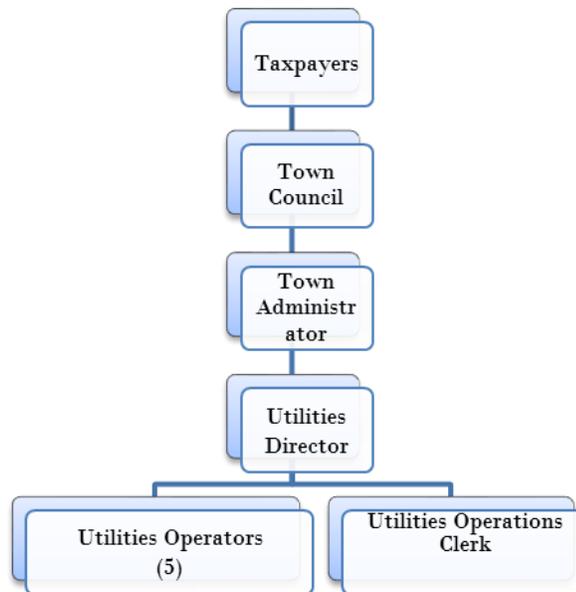
There are 7 employees in the Utilities Department including the Utilities Director. An additional position was added in 2014. (See attached organizational chart).

Departmental Personnel

	Fund	FY2015 FTE	FY2016 FTE
Director	10	0.5	0.5
Utilities	10	6.0	6.0
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FTE-Full Time Equivalent		6.5	6.5

Staffing levels increased from FY2013-FY2014.

Department Organization Chart



WHY DO WE PROVIDE THE SERVICE?

Organizational Mandates

- South Carolina Code 1976, §5-31-610, Authority to purchase, construct system.
- South Carolina Code 1976, §6-21-50, Authority to improve existing system.
- South Carolina Code 1976, §6-21-80, Water, sewage etc.
- South Carolina Code 1976, §44-55-10 Water, Sewage, Waste Disposal and like, Safe Drinking Water Act
- Ordinance 10-10-85, Utility Fees
- Ordinance 8-13-98
- Ordinance 9-10-98, Repair of damage to stormwater facilities
- Ordinance 9-8-94, Water Service
- Ordinance 6-12-86, Sanitary Sewer
- Ordinance 8-1-89, Sanitary Sewer
- Ordinance 8-9-07 Stormwater Management

WHERE DO WE WANT TO BE?

Vision

The vision of Edisto Beach Utilities Department in 3-4 year's time is:

The Edisto Beach Utilities Department will continue to provide the water and sewer services to Edisto Beach through:

- Commitments to the community to ensure adequate supplies are available.
- Pursuing improvements to the water and sewer systems to meet the community's needs and desires.

Mission Statement

The central purpose and role of Edisto Beach Utilities Department is defined as:

The Edisto Beach Utilities Department is committed to providing water and sewer services on a 7 day/24 hour basis by monitoring, maintaining and repairing Edisto Beach's Utility wastewater plants, sewer pump stations and the water facilities. The Department is dedicated

to providing reliable potable water for the citizens and visitors to the beach. As part of this program, the Department ensures adequate supplies are available for fire protection.

Governing Principles

The values and beliefs governing Edisto Beach Utilities Department will include the following:

- Services will be effective and provided by competent staff that are accessible and cross trained in water and wastewater.
- Use a proactive approach to objectively review services provided and changes needed for continued responsiveness to the public.
- Teamwork.
- Provide a day's work for a day's pay.
- Maintain up-to-date, quality equipment.
- Ensure safe operation of the Town's water and wastewater system.
- Truthful, trustworthy and ethical.
- Safety and security minded.

Major Goals

Edisto Beach Utilities Department will achieve the following key targets: over the next 3-4 years:

- Increase water capacity to ensure future water needs are met either through additional capital improvements or through reduction in use.
- Determine ways to increase sewage capacity and fund these increases.
- Address water quality issues and violations of the Department of Environmental Control secondary drinking water standards.
- Import all historical data and maintain a database of data for looking at trends and shifts for purposes planning.

Department Objectives

Short Term objectives of the Edisto Beach Utilities Department are summarized as:

Water

- Construct the Jungle Shores Water Line Expansion project by the 3rd quarter of FY 2015-16.

Sewer

- Complete the Preliminary Engineering Report on the Wastewater Treatment facility by 4th quarter of FY 2015-16.
- Rehabilitate Lift Station Bay Point and Pompano by 4th quarter of FY 2015-16.

Long Term Department Objectives

Long Term objectives of the Edisto Beach Utilities Department are summarized as:

- Implement automated meter reading so meters can be read monthly
- Expand SCADA capabilities to include wastewater system
- Adopt a plan for future water and sewer rates i.e. grants, hydrant fees, tap fees, impact fees
- Sewer expansion

HOW DO WE GET THERE?

Key Strategies

The Edisto Beach Utilities Department will pursue the following critical strategies:

1. Develop a schedule to check for leaks throughout the system by utilizing data loggers
2. Develop and implement a schedule for replacing and upgrading water lines and looping systems to improve water quality.
3. Look at public/private funding options
4. Tap into the 1% capital projects sales tax referendum to fund water quality and quantity improvements (2022)

The following important strategies will also be followed:

1. Diversify funding sources by seeking grant funding in addition to enterprise funding
2. Become proactive and innovative

External Environment

(Opportunities and Challenges)

The purpose of this section is to explore the environment outside the Department in order to identify opportunities and challenges (formerly known as threats) the Department anticipates in the future. Although emphases are on future opportunities and challenges, present opportunities and challenges are also addressed. This section is further refined and detailed, if necessary to monitor forces and trends, key resource controllers and actual and potential competitors or collaborators and important forces affecting competition and collaboration the Department faces. The following is a compilation or executive summary of challenges and opportunities division-wide.

Opportunities:

- Keep abreast of new technologies and innovations and utilize to the innovations to optimize current system
- Actively research and apply for grants, cooperative, and emergency funding

Challenges:

- Grants not available unless low to moderate income
- SRF not available at the discounted rate unless the mean household income is less than the state's mean household income
- Increased regulatory control with no funding attached i.e. fluoride levels, copper fittings
- Pressure from community to improve water quality with no funding and insufficient water and sewer capacity
- Potential regulatory impacts from having septic systems on water front
- Lightning damage to systems
- Natural disasters
- Aging infrastructure and lack of funding

Internal Environment

(Assets and Limitations)

The purpose of this section is to explore the environment inside the Department in order to identify assets (formerly known as strengths) and limitations (formerly known as weaknesses) the Department currently faces. This process is utilized to induce both group cohesion and action. Assets are defined to build upon and limitations are set forth so they can be faced and addressed. This section is further refined and detailed along with the external environment, if necessary to monitor forces and trends, key resource controllers and actual and potential competitors or collaborators and important forces affecting competition and collaboration the Department faces. The following is a compilation or executive summary of assets and limitations division-wide.

Assets:

- Dedicated, knowledgeable, and professional staff
- Staff that is cross trained and licensed in water and wastewater and able to repair line damages and troubleshoot system repairs
- Vehicles and equipment that allows staff to maintain and repair systems
- Generators to run lift stations and wells when power outages occur
- Provide direct services that impact citizen public health and quality of life
- Exceptional response time and sufficient staff to provide this response time
- SCADA system that allows staff to turn pumps on and off remotely

Limitations:

- Space for water and sewer improvements
- Lack of adequate reserves
- Rate structure
- Limited personnel who understand and know location of assets
- Cash flow/meter reading
- Vehicle for reading meters

Strategic Issues

1. How can the Edisto Beach Utilities improve water quantity and water quality while keeping costs down?

This issue is quite divisive for the Town of Edisto Beach. On one hand, one group feels water quantity is the more pressing issue and the other group feels water quality is the most pressing issue. Below is an overview of what has happened to date and the current direction by Council.

Water Quantity Issue

The Town's storage capacity consists of a 100,000 gallon elevated storage tank located at the end of Holmes Street constructed in 1998. The elevated storage tank is the shape of a pedesphere and has a head range of 25 feet and an overflow elevation of 163.18 feet. The Town funded this capital improvement through State Revenue Bonds. The Town also has a 200,000 gallon ground storage tank located off of Palmetto Road installed in 1990. The ground storage tank was funded using Series 1990 Refunding Revenue Bonds. The funding amount was \$460,000. Water from the 200,000 gallon tank enters the distribution system via two booster pumps. Both bonds were refinanced in 2012 at a cumulative savings of \$181,726. The Series 2012 bonds were negotiated for a 30 year term that closes in 2042. The amount of the Series 2012 bonds is \$1,616,607.30 with annual payments of \$69,662 and a principal payment of \$375,000 due every 5 years. The net interest is 3.2%. \$429,234 was placed in a construction fund to pay for capital improvements or maintenance to the water and sewer systems. The S&P bond rating was improved from A+ to AA+ in 2014.

(The Town's permit allows us to pump 1,411,200 gallons of water per day/ 35,136,000 gallons per month for a total withdrawal per permit of 256,000,000 gallons. In 2013, the Town pumped 192,580,000 gallons.)

Regulations also restrict how long a pump can operate per day. Each pump can only pump 18 hours a day. In July of 2009, the Town's water usage exceeded 1.2 million gallons a day. [Note: water usage was reduced by 1,784,800 gallons per year when Wyndham took laundry off island (total water billing in 2008 was 180,397,241). Reconfiguration of the chlorinator of WWTP saved 8,000,000 gallons water. Irrigation restrictions were revised in 2014.]

The Town has to be cognizant not to get too much storage because of the dramatic demand changes from the off season and the tourist season. Water can become stale and cannot be stored indefinitely.

Is capacity an issue? Many older, small beach homes are being replaced with large rental or primary homes. Changes in technology may be contributing to a capacity issue. More residents are installing whole house Reverse Osmosis systems which use more water. If the homes are connected to the sewer system, the Town may see impacts to on the water side as well as the sewer side.

In September 2008, EarthTech/AE COM prepared a Water Master Plan for the Town of Edisto Beach. Water storage was identified as an outstanding issue because of the Town's ability to meet water demand and storage and the Department of Health and Environmental Control's minimum standard for storage capacity requirements. Water storage is a critical component of a water system because it provides not only the resources to fight fires, but provides equalization of pumping resources and maintenance of stable water pressure in the distribution system.

Based on advantages and disadvantages of both elevated and ground storage tanks, Earthtech recommended pursuing the addition of an elevated water tank. They state the long term reliability and minimal oversight required for an elevated storage tank was better suited for the Town.

The site (Jungle Road) of the tank was chosen to essentially balance the water system hydraulically by eliminating low fire flows on east of Portia Street which can occur when the booster pumps are not running. Pressures throughout the system would be better equalized and the tank would increase water quality due to increased flushing of the system on the eastside of Town. Reliability is improved since the new tank would serve as an additional water source in an area of the Town lacking water supply wells. The estimated cost of engineering and construction is \$1,200,000.

The Town spoke with the State about potentially locating the water tower on State land. This was not amenable to them. Another potential site was located on Jungle Road (Lot E, Block 2) on Town owned property between the Piggly Wiggly and Palmetto Plaza. In July 2009, the Town was made aware of a deed restriction because a conservation grant funding was used to construct the parking area. The only way to remove the deed restriction is by conversion of the property. This means another piece of property of equal or greater value must be substituted for the property in question. PRT offered to use State property (Paris Mountain) for this conversion. On September 17, WPC was hired to do preliminary geotechnical work on the site to see if the site is a feasible location for water tank. Preliminary results indicate the site is feasible; however, public input on November 12, 2009 was negative. Deed restrictions would need to be resolved to move forward.

What has changed since the study of 2009? In 2010, the booster pumps at the wellfield were replaced correcting pressure problems on the north side of Edisto Beach and by replacing the well pumps, more GPM can be pumped. Other changes, such as the relocation of Wyndham laundry services and reconfiguration of the chlorinator on WWTP have mitigated some of the short term capacity problem.

URS completed a study in 2013 to address water quality and quantity issues on Edisto Beach. The process was lengthy and included numerous public meetings to address comment and concerns from all. The proposed approach was

construction of a reverse osmosis facility at McConkey Square and an aquifer storage system at the wellfield at the State Park at an estimated cost of \$8.4 million which included Aquifer Storage Recovery.

Aquifer Storage Recovery (ASR) is the storage of water in a well during times when water is available, and recovery of the water from the same well during times when it is needed. ASR provides a cost-effective solution to many of the world's water management needs, storing water during times of flood or when water quality is good, and recovering it later during emergencies or times of water shortage, or when water quality from the source may be poor. Large water volumes are stored deep underground, reducing or eliminating the need to construct large and expensive surface infrastructure. In many cases, the storage zones are aquifers that have experienced long term declines in water levels due to heavy pumping to meet increasing urban and agricultural water needs. Groundwater levels can then be restored if adequate water is recharged. Most operating ASR sites are storing treated drinking water. When recovered from storage, this water usually requires only disinfection before being sent out to the water distribution system. The technology is used to help meet emergency or peak demands.

This went to an advisory referendum on June 25, 2013 and the vote was 164 (for) and 187 opposed. After the referendum, Council researched progressive design build and listened to presentations related to this approach to address water quality and quantity issues. In September 2013, Council directed staff to issue a Request for Qualifications to determine what if any other options are available to correct the water quality and quantity problems. A Request for Proposals was issued and Wharton Smith was the successful consultant. This project is in the evaluation stage and at the end of the preliminary phase will produce a matrix with guaranteed maximum prices.

Water Quality Issue

In the 1990s, legislators of South Carolina (Senator Fritz Hollings and Senator McKinley Washington) obtained federal grant funds to bring City of Charleston water from Adams Run down SC 174 to the Town of Edisto Beach at no cost to the beach. Although Mayor Larry Smith of Edisto Beach supported such action, a group of citizens opposed the project claiming this would bring development to the island and beach. Bringing water across the north Edisto River from Seabrook Island was also discussed around this time. Because of the questions regarding water quality, the Town hired BP Barber to propose a plan for water quality.

The Town provides an RO facility located at Town Hall at 2414 Murray Street. Drinking water is provided free of charge. In 2008, the Town dispensed over 1 million gallons of water through this facility.

In 2001, BP Barber completed a study for the Town of Edisto Beach which evaluated:

- Installing a water line from the City of Charleston through Seabrook Island to the Town
- Treating the water using the usual conventional treatment technologies
- Using two new technologies, Reverse Osmosis and Electrolysis

The study concluded that the Reverse Osmosis system was the most practical and economical treatment technology. Estimated costs were \$5,300,000 in 2001.

As citizens become increasingly concerned regarding salt water intrusion, other ideas have been brought forth which include, but are not limited to:

- ~~1. Re-opening discussions with Charleston to bring water to the beach~~
2. Pumping water from the Edisto River,
- ~~3. RO trailers,~~
4. RO under sink,
- ~~5. Ozonation (does not remove salt)~~
- ~~6. desalination plants~~
7. deep aquifer water wells (Middendorf Aquifer)
8. ASR Wells

Each potential solution should be evaluated and analyzed to determine which has the greatest cost to benefit ratio.

Discussions have taken place regarding the assumption that if water was provided by a wholesaler than water costs would go down because the current staffing of utilities would not be required. This may not be the case, since the utilities operators are dual licensed for water and wastewater. Regardless of where the water comes from, distribution lines will still require maintenance and repair as well as the regulatory requirements regarding the sewer side of utilities.

Although it is possible the same level of staffing may not be required, the staffing level would need to be maintained to operate the sewer system as well as maintain the distribution system.

The critical path of both water quality and water quantity issues is funding. Funding remains an obstacle because the Town does not qualify for typical water related grants because grant qualifications are generally based on median income or median home value. Grants are desirable because they relieve the Town of funding 100% of a potential project. Because the utility is an enterprise fund, meaning it operates exclusively from fees collected for the service or product, in order to fund any improvements to the water system, rates would have to be adjusted to cover the cost.

Funding may be possible from the Federal Emergency Management Agency (FEMA) but pre-hazard funding is competitive and it may be more conducive to get funding under the hazard mitigation program if a disaster were to impact

Edisto Beach. It is also possible that Colleton County would be willing to budget funding, but this is not likely as Colleton County could choose to establish itself as a water utility. Funding could be obtained through a 1% Capital Project Sales Tax but this project was not submitted as potential project by Council. The opportunity for reapplication may arise in 2022. Other sources of funding are State Revolving Funds (SRF) and Revenue Bonds. Interest rates hovering around 1.9% make financing at this time more attractive and the Town has been approved for \$8.4 million dollars in the SRF 2015 project list. Revenue bonds are also an option and the current interest rate is 3.5% (2013) but is expected to increase in 2015-16. There may also be additional options of funding available and would recommend consulting with a bond attorney before proceeding.

URS completed a study in 2013 to address water quality and quantity issues on Edisto Beach. The process was lengthy and included numerous public meetings to address comment and concerns from all. The proposed approach was construction of a reverse osmosis facility at McConkey Square and an aquifer storage system at the wellfield at the State Park at an estimated cost of \$8.4 million. This went to an advisory referendum on June 25, 2013 and the vote was 164 (for) and 187 opposed.

After the referendum, Council researched progressive design build and listened to presentations related to this approach to address water quality and quantity issues. Council directed the Water and Sewer committee and staff to proceed with finding a phased approach to resolve problems with infrastructure, quantity and quality. They would like to see infrastructure addressed first. When proceeding with quantity, they want the projected increase in future capacity needs reduced from 40% to 20% and want prices from conception to completion in sequential phases with no duplication or improvements that would be abandoned

A Request for Proposals was issued and Wharton Smith was the successful consultant. This project is in the evaluation stage and at the end of the preliminary phase will produce a matrix with guaranteed maximum prices.

The Town has developed and is funding a capital improvement plan to maintain and replace aging and/or undersized water lines. As infrastructure ages, a plan for replacement is critical.

2. What are the challenges to expanding the waste water facility?

The waste water system on Edisto Beach is a compilation of several individual systems that were installed in the 1970s and linked to provide a limited amount of sewer treatment. In many instances the location and condition of lines and assets is not known. Funding has been such that upgrades have not occurred and problems are addressed on a reactionary basis. The location of the aerated lagoon is a limiting factor related to expansion of the facility. Options being reviewed are expansion of the current facility vertically on the same foot print; purchasing additional property adjacent to the aerated lagoon; locating a treatment facility

off-beach. The limiting factor to offering sewer service to many homes on Edisto Beach is the plant's capacity.

Records indicate the current usage exceeds 80% capacity and an engineering study is needed. The calculated usage in August 2011 was 84%. Staff feels this estimate is on the low side due to advances in technology where an increasing number of homes are equipped with whole house reverse osmosis systems which use and waste more water than what was used to determine the current capacity, but usage does not substantiate this assumption. More analysis is required to determine actual and committed capacity.

Other challenges realized during the permit renewal process were negotiations with a third party (Plantation Golf LLC) for effluent disposal. On January 18, 2012, DHEC issued a permit for effluent disposal on the golf course and this was appealed. The appeal was upheld.

In August 2011, Lift Station B failed during a high usage period in conjunction with heavy rainfall. Upon further evaluation of the lift station, it became evident the failure was caused by sand infiltration and the impacts of such sand of the pumps. This was of concern since this station had been rehabilitated in July 2008 and capitalized over a 20 year period. (Capitalized over 20 years just means that it should have a life of 20 years)

As a first step, the lift station was vacuumed and over 2 yards of sand was removed. The first assumption is that during a directional boring project of SCE&G, a gravity line was compromised. This would result in a high volume of sand infiltration that could have compromised the pumps. The system was smoke tested for inflow and infiltration and only a few minor breaches to the system were noted and corrected. Also noted was a problem between Lift Stations "A" and "B" working against each other. This problem was corrected by replacing the Variable Frequency Drive at Lift Station B which synchronized the Variable Frequency Drives between pumps stations B and A. All lines are being jetted and viewed with an in-pipe camera to see where problems may exist.

Because the system consists of numerous small systems linked together, staff is reviewing and mapping DHEC permitted capacity for each small system so management can best decide whether to issue new sewer taps and also for information regarding whether the systems need to be upgraded because capacity is exceeded.

In 2012, Fat Jacks lift station failed and had to be bypass pumped. The pumps and control panel were replaced and a backup generator hookup was installed. The Town is televising the sewer system during the "off" season to provide an internal view of the system to help staff evaluate and determine plans for correcting system problems.

In 2014, Council issued and lifted a moratorium on the Docksite/Scott Creek system which is being investigated for problems and solutions by AECOM. A work authorization has been issued to American Engineering for the Preliminary Engineering Report.

3. How does the Town of Edisto Beach get beachfront homes off septic systems?

As with the problems regarding water, the sewer system likewise has its own set of problems. The sewer system does not have the capacity to provide service to each housing unit on the beach. The sewer system should be upgraded to provide additional capacity. This can be accomplished in part by making modifications (adding aerators and moving baffles) to the existing wastewater treatment pond that could potentially double the capacity. Once these modifications are completed, any further needed capacity could only be obtained by constructing additional treatment ponds. The location of such ponds would present a problem.

Capacity is not the only issue. A majority of the Town does not have sewer lines that are close enough to allow sewer hook-up. Construction of additional sewer lines and the necessary lift stations to pump sewage to gravity flow lines would need to be completed and these costs can be very high. Vacuum pump systems and low pressure sewer systems should be researched to determine if there is a less costly alternative to pump stations. In 2010, the DHEC issued numerous swim advisories (Mikell, #38, Edisto) for high bacteria counts. These problems may be linked to failing septic systems. Currently there are no solutions to this issue.

In addition, the sewer system, like the water system needs to be placed on a maintenance program where funding is established to begin replacement and maintaining aging infrastructure.

HOW DO WE MEASURE OUR PROGRESS?

Performance Measures

Each Department has established performance measures.

Financial Data

Department	09-10	10-11	11-12	12-13	13-14	14-15	15-16
	Actual	Actual	Actual	Actual	Actual	Actual	Budgeted

Water	749,078	1,012,391	807,295	835,995	821,513	760,424	1,020,450
Sewer	514,324	786,952	564,866	568,777	575,326	494,407	619,300

Performance Measures

Measures:	Actual FY 12	Actual FY 13	Actual FY 14	Actual FY 15
<i>Workload indicators:</i>				
# of water meters	2,174	2,178	2,188	2,186
# of irrigation water meters	65	67	68	69
# water meters read	4,468	4,722	4,526	4,473
# of wells	6	6	6	6
# of lift stations	13	13	13	13
# of meters installed/replaced	51	38	46	41
# miles of water line	26.23	26.23	28.23	28.23
# miles of sewer line	13.47	13.47	13.47	13.47
# of complaints	19	5	17	9
# of adjustments made to invoices	22	24	12	15
# of repair projects (MHRS)	658	1,330	1,311	1,206
Respond to plant/SCADA/power outages	3	3	3	0
DHEC compliance (water)	1,837	2,098	2,263	2,280
DHEC compliance (sewer)	4,068	4,716	5,095	5,160
Building/Grounds Maintenance (MHRS)	773	787	1,240	1,120
Equipment Maintenance (MHRS)	363	950	1,920	2,070
Utility locates (MHRS)	104	170	306	150
Training (MHRS)	90	151	270	108
<i>Effectiveness indicators:</i>				
# of low pressure complaints	2	1	21	1
Total gallons pumped (MG)	183	177	191.39	165
Total gallons treated (MG)	50	41	57.77	50
<i>Efficiency or unit-cost ratio:</i>				
Cost of repairs to water lines	37,217	27,000	11,300	118,950
Cost of repairs to sewer lines	11,189	22,000	29,000	77,100
Cost of Water Meter	200	250	250	250
Average cost of water bill	174	386	388	174
Average cost of irrigation meter bill	344	287	288	288