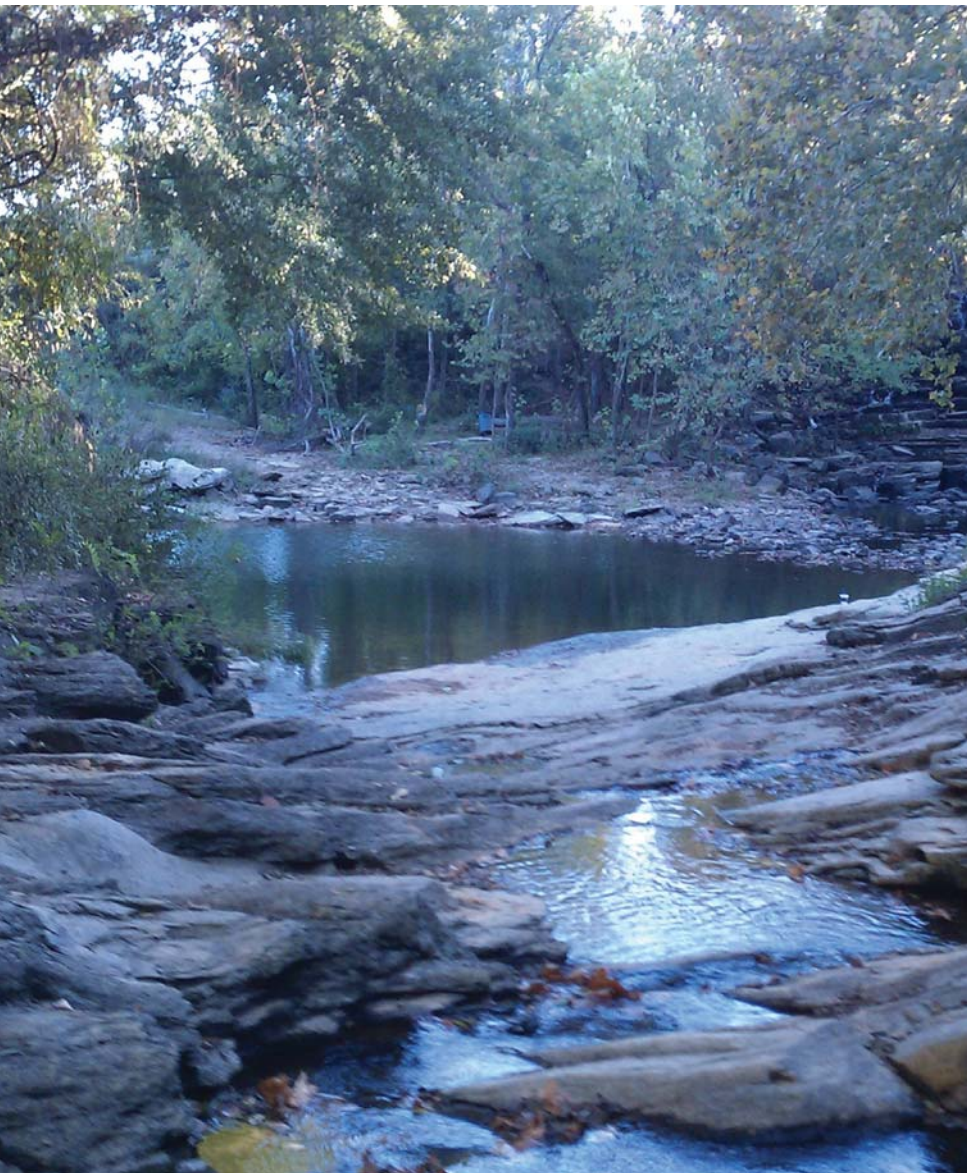
Augusta
GEORGIA

Stormwater Business Plan

CITY OF AUGUSTA, GEORGIA



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Stormwater Business Plan
Executive Summary

Augusta-Richmond County has real, growing, and unresolved stormwater infrastructure problems. The Augusta Engineering Department (AED) has studied these problems and has developed a fact-based, thoughtful, and reasonable plan to address these problems. This Stormwater Business Plan summarizes the existing stormwater challenges facing Augusta-Richmond County and the evaluation process that led to the recommended stormwater utility.

Augusta-Richmond County has real, growing, and unresolved stormwater infrastructure problems. The AED is responsible for building and maintaining a stormwater system that covers 329 square miles and includes 731 miles of ditches, 568 miles of storm drains, over 12,600 catch basins, and nearly 1,000 flood detention ponds. This stormwater system must safely collect, treat, and convey runoff from every part of the county including the greatly increased run- off from developed properties. Runoff from homes, subdivisions, and businesses flows from smaller ditches and pipes into gradually larger infrastructure that flow under and along Augusta's roadways and into local streams. The public stormwater system benefits everyone who lives or works in Augusta-Richmond County. We all benefit from safe roads, upstream stormwater systems that protect us from flooding, water quality treatment that protects stream integrity, and the routine maintenance that helps keep Augusta the "Garden City".

Figure 1. Paterson Bridge Sinkhole

Figure 2. Mims Road Sinkhole

Augusta-Richmond County is currently facing an unusual combination of issues, each in itself a major concern: (1) aging and failing infrastructure; (2) local flooding of homes, businesses, and roadways that includes erosion and under-sized channels in the vast rural areas; and (3) growing demands from residents and businesses to keep the ditches and pipes along roadways trimmed and attractive.

Figure 3. Colony Park Culvert Collapse

(1) Aging and Failing Infrastructure

First settled in 1736, Augusta-Richmond County is one of the oldest cities in Georgia. The stormwater infrastructure is also some of the oldest in the state. Unexpected and sudden stormwater infrastructure failures such as the Patterson Bridge Sinkhole, Mims Road sinkhole, and the Colony Park culvert collapse are proof that the system is aging. Thankfully nobody was hurt as a result of these failures but they were expensive to repair and disrupted normal traffic patterns. The historic lack of adequate stormwater infrastructure funding delayed the routine maintenance and repairs that could have avoided these failures.

Figure 4. Downtown Flooding (1888)

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AED has an estimated backlog of over $240 million in stormwater infrastructure repairs, of which $100 million are rated as critical projects. The current funding from the General Fund and Special Purpose Local Options Sales Tax (SPLOST) is insufficient to address the needs in the system. Major capital projects must compete against citizen concerns and other non-stormwater maintenance priorities for attention and frequently lose out.

Figure 5. Gordon Highway Flooding (1990)

(2) Local Flooding of Homes, Businesses, and Roadways

Flooding is not a new problem in Augusta-Richmond County. Images of devastating flooding, such as Figure 4, date back to 1888. The creation of Clark Hill Dam upstream of Augusta in the early 1950's and other efforts have mitigated the flooding from the Savannah River, but major flooding challenges as recent as 1990 (Figure 5) and routine flooding of homes and roads still exist.

Figure 6. Residential Flooding

Development increases runoff. The conversion of forest to yard increases the volume of runoff almost tenfold and conversion from yard to pavement increases the volume, pollution, and flood flows about three times. The AED has stringent new development requirements designed to protect against downstream flooding. More recently, the Augusta Planning and Development Department updated the floodplain maps, notified property owners of potential flood risks, and even bought several floodprone properties. Despite these efforts, flooding challenges devastate some homeowners and create unsafe roadway conditions for residents and businesses during heavy rains.

Figure 7. Commercial Flooding

Currently, 107 of our neighbors live in harm's way and are eligible for federal funding due to their high and growing risk of flooding. SPLOST funds have been used to match federal funds to permanently remove 30 homes and allow the properties to act as flood storage to protect downstream properties; however more demand for property acquisitions remain.

Figure 8. Roadway Flooding

While the catastrophic flooding (Figures 5 and 6) gets more media coverage, routine nuisance flooding (Figures 7 and 8) also impacts the quality of life and safety of transportation corridors in Augusta. More frequent maintenance of the stormwater system such as removing debris from ditches, pipes, and traps can often

address nuisance flooding issues. With current staffing, AED must balance routine maintenance with addressing customer requests. Therefore, damage has to already have happened or be imminent for Augusta to be able to respond.

Part of the additional funding will be used to help protect Augusta residents through construction of projects to minimize flood impacts and reduce repetitive losses and interruptions to local commerce. In addition, hiring more staff dedicated to routine preventative maintenance would allow AED to better ad- dress citizen requests as well as catch potential flooding problems before they happen. Finally, funds would support programs such as a proactive dredging of several lakes in the Augusta Canal Basin to maintain storage volume for peak rainfall and construction of flood reduction projects in the Rocky Creek Basin.

(3) Growing Demands from Residents and Businesses. Responding to customer concerns is a strong priority for the Augusta Engineering Department. On average, they receive 3,300 stormwater-related complaints per year to either the Augusta Cares call center or from direct phone calls. Figure 9 shows the location of calls and Figure 10 shows the number of calls received over the past 10 years. Over half of these work orders were related to stormwater maintenance activities such as mowing right-of-way areas, trash cleanup, and addressing unsightly erosion.

The AED is able to address approximately 68% of these calls (Figure 11), typically within one month. That leaves over 1,000 complaints, most of which are legitimate, with no resolution. Given the scarcity of funds, AED must choose between more visible complaints, such as unsightly drainageways, or more invisible pipe system rehabilitation. The gap between need and ability to respond is now too big to be bridged. As the demands of aging infrastructure and routine maintenance increase, the ability of AED to respond to customer needs will likely decrease under existing staff and funding levels.

Figure 9. Location of Customer Concerns

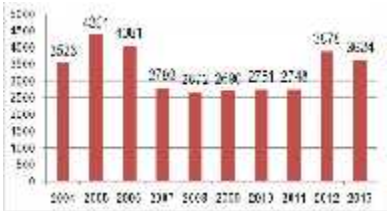

Figure 10. Annual Stormwater Customer Calls

Figure 11. Type of Customer Concerns

The Augusta Engineering Department has a plan to address these challenges. The plan is moderate, not extravagant, and strikes a balance between preventing stormwater damage and minimizing stormwater program cost. The plan emphasizes "on the ground" results – fixing, cleaning, rebuilding, enlarging, and protecting our citizens and property. The enhanced stormwater program would focus on the following three priorities:

1. *Manage Augusta's Stormwater Assets in a Sustainable Manner.* AED will implement a sustainable asset management program that minimizes the necessary expenditures on maintaining stormwater assets by extending their lifecycle. This focus includes collecting and maintaining the information needed to support sound asset management decision making (see Figure 13). Sufficient staff and funding to perform routine maintenance is critical to addressing this priority.

2. *Protect Health, Safety, and Well Being of the Community.* Proper stormwater planning and management can reduce the risk of flooding events that impact residents and businesses. Impacts of flooding can range from reduced safety resulting from ponding on local streets to the inundation of family homes. Addressing areas where the stormwater pipes are not properly sized to handle storms and performing routine maintenance to keep the system working as designed are critical to protecting the community.

3. *Support Realization of the Garden City.* The phrase "realize the Garden City" was coined as part of Augusta's 2010 Sustainable Development Agenda. As it relates to stormwater, this means addressing customer concerns in a reason- able timeframe. This also includes promoting green infrastructure, as well as maintaining a routine schedule for street sweeping, right-of-way maintenance, and fixing trap lids.

These priorities shaped the recommended increase in staffing, operational costs, and capital improvement expenditures described in the following pages.

Figure 12. Historic Flood Markers along the Riverwalk

Figure 13. Sample of Augusta's Infrastructure Inventory

Figure 14. Paddling on the Savannah River

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Common Stormwater Definitions and Acronyms:

Stormwater = water that originates during precipitation events and snow/ice melt. Stormwater can soak into the soil (infiltrate), be held on the surface and evaporate, or runoff and end up in nearby streams, rivers, or other water bodies. The type of land use determines what percentage infiltrates and what percentage becomes stormwater runoff.

Impervious area = Hard surfaces such as rooftops, driveways, and parking lots that do not absorb stormwater.

Equivalent Residential Unit (ERU) = Representative impervious area for single family properties in Augusta. In Augusta, an ERU is 2,200 square feet of impervious area.

Single-Family Residential (SFR) = Residential property owned/occupied by a single family (includes condos, townhomes, duplexes, and triplexes).

Non-Single Family Residential (NSFR) = Any property that is not classified as a single-family residential. Includes multi-family residential parcels (quads, apartments complexes, mobile home parks, other commercial-residential), and non-residential parcels (commercial, agricultural, industrial, etc.).

A More Robust Stormwater Program Requires Additional Funding

Currently, the General Fund is unable to provide sufficient funds for stormwater infrastructure maintenance, even when combined with voter-approved SPLOST funds. The proposed funding levels for addressing infrastructure are not extravagant but are sufficient to fund the three stated priorities and begin to reduce the $240 million backlog of known stormwater infrastructure problems.

Existing Stormwater Program

Currently, Augusta-Richmond County only has 6 crews dedicated to stormwater maintenance which is less than one crew per Commission district. Funding for staff and projects comes primarily from the General Fund and Special Purpose Local Options Sales Tax (SPLOST) with a small percentage of funding generated from permitting fees.

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Total Stormwater Program Cost	$10,480,000
Revenue from NPDES Permit Fees	$15,000
Revenue from SPLOST - Salaries & Benefits	$820,000
Revenue from SPLOST - Vehicle Cost Allocations	$760,000
Revenue from SPLOST - Consulting/Contracting	$1,000,000
Revenue from SPLOST - Capital Infrastructure Projects	$5,000,000
Revenue from General Fund	$2,885,000

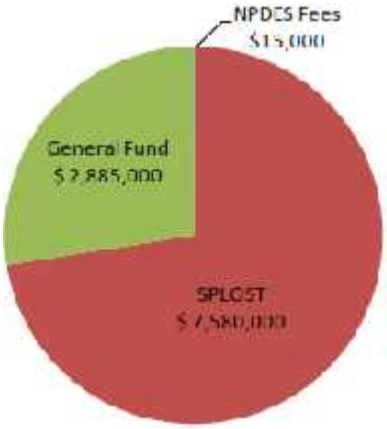

Figure 15. Current Blend of Stormwater Funding

Approximately 75% of the total stormwater program costs are currently funded by SPLOST funds (Figure 15). While SPLOST funds are important, the amount available to stormwater projects is unpredictable. Stormwater projects still must compete for SPLOST funds with other infrastructure projects. The uncertainty and insufficiency of the current stormwater program funding is not sustainable to meet the community's needs as evidenced by recent infrastructure failures.

Recommended Stormwater Program

In order to increase the level of maintenance, the future program doubles the number of crews for a total of 12 crews. These crews will provide services such as right-of-way mowing, trash cleanup, street sweeping, trap cleaning, and small maintenance projects.

Total Stormwater Program Cost	$19,020,000
Revenue from NPDES Permit Fees	$15,000
Revenue from SPLOST - Salaries & Benefits	$0
Revenue from SPLOST - Vehicle Cost Allocations	$0
Revenue from SPLOST - Consulting/Contracting	$0
Revenue from SPLOST - Capital Infrastructure Projects	$5,000,000
Revenue from Stormwater Utility	$14,005,000

Figure 16. Future Blend of Stormwater Funding

SPLOST will remain an important component of the future program and will primarily be used to accelerate construction of the $240 million of known and unfunded infrastructure projects. However, staff and funding for routine maintenance will be funded by the proposed stormwater utility. Bonds (Revenue or General Obligation) may also be used to expedite construction of the priority infrastructure projects with the stormwater fee paying debt service.

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A Stormwater Utility is the Most Equitable Funding Mechanism

A stormwater utility, similar to a water and wastewater utility, charges a fee proportional to the services provided. The proposed stormwater utility was tailored to Augusta-Richmond County to create an equitable rate structure that was not overly complex. This section describes some of the key aspects of the stormwater utility rate structure.

In Augusta, the proposed stormwater utility will be based on impervious area, since the development of property has a direct correlation to the amount of stormwater a property generates and Augusta must manage. This is more equitable than a tax-based system which is tied to property value and not related to runoff contribution. Properties with over 400 square feet of impervious area are considered developed and would receive a stormwater fee.

The billing unit for the stormwater fee is called an Equivalent Residential Unit (ERU) which is the representative impervious area for single family properties. In Augusta, an ERU is 2,200 square feet of impervious area (IA). Augusta's data shows that the percentage of the parcel dedicated to impervious area for single-family residential properties (SFR) is typically half of the percentage for non-single family residential (NSFR) properties. The fee structures for SFR and NSFR reflect this difference, as outlined below, where SFR properties are charged less per unit of IA area but do not have the fee-reducing crediting opportunities of NSFR properties. NSFR properties can reduce their impacts through on-site stormwater management and attain a significant fee reduction.

Single-Family Residential Properties

There is a great deal of variety in the amount of impervious area for residential properties. To reflect this, a two-tiered residential structure is recommended with higher charges for the SFR properties with the greatest impervious area. Over 90% of all SFR properties fall into the low tier.

Tier	Impervious Area	Bill Rate
Low Tier SFR	< 4,400 ft2	1 ERU = $6.40 / month
High Tier SFR	> 4,400 ft2	2 ERU = $12.80 / month

Rate Calculation

The stormwater utility rate was carefully calculated as follows:

1. Calculated the amount of funding that was needed to provide the desired level of infrastructure maintenance and rehabilitation.
2. Determined the number of total billing units by summing the total ERUs associated with SFR Tier 1 properties, the SFR Tier 2 properties, and NSFR properties.
3. The total funds needed divided by the total number of ERUs equals the proposed rate of $6.40 per ERU.

Figure 17. Example NSFR Property Impervious Area

Credits

The specific credits offered include:

- 40% for meeting detention requirements
- 5% for implementing more stringent design standards for detention
- 15% for meeting water quality requirements
- 5% for certain industries holding a state Industrial General Permit (IGP)

Credits are cumulative, so a NSFR property could receive up to a 65% credit. A credit application is required to certify that the stormwater controls were designed and maintained in accordance to design guidelines.

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Non-Single Family Residential Properties

The impervious area for each NSFR property was determined based on Augusta's aerial photographs. The rate is calculated by taking the total impervious area, dividing by the ERU of 2,200 square feet, and then rounding to the nearest whole number. Credits, or reductions in the stormwater fee, will be available for NSFR properties that provide and maintain stormwater controls that provide beneficial peak flow reductions and/or water quality treatment.

Figure 18. Example Drainage Project

Figure 17 shows an example NSFR property that is fully developed and has 42,800 square feet of impervious area or about 19 times the amount of the average home (42,800 / 2,200 square feet = 19.4 which rounds to 19 ERU). The monthly base fee would be 19 ERU x $6.40/month = $121.60/month. The example property has and maintains a detention pond and therefore is eligible for a 40% credit, reducing the fee to $72.96/month, or an equivalent charge of $3.76 per ERU.

Figure 19. Example Drainage Project

Next Steps

The stormwater fee, if adopted by Commission, will be added to the monthly water and sewer bills. There will be a separate stormwater line item. The plan is to complete the rate setup process and send draft bills to all property owners in Spring 2015 with the first official bills being distributed in July 2015. The draft bill will provide customers with an opportunity to resolve concerns prior to receiving their first bill.

The Augusta Engineering Department will be ready July 1, 2015 to begin the more robust maintenance program. Although the intent is to eventually hire maintenance staff, initially subcontractors will be used to perform routine maintenance such as street sweeping, right-of-way mowing, ditch cleaning, and trap cleaning.

In addition to the planned maintenance activities, the Augusta Engineering Department has identified some of the priority capital projects that will be funded by the stormwater fee with supplemental SPLOST funds to support the storm-water program. Figure 20 shows some of the priority capital projects.

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In Summary

Augusta has growing, real and unresolved stormwater infrastructure challenges as demonstrated by recent system failures, a $240 million backlog, and high volume of citizen calls. The AED has a thoughtful and reasonable plan to address infrastructure problems that focuses on asset management, public safety, and the realization of the Garden City. It will cost more money to tackle these unresolved problems, but a stormwater utility is the most equitable way to fund needed maintenance and repair activities. Maintenance of the stormwater infrastructure is a community priority and needed to protect residents and thriving local commerce.

Planned Priority Capital Projects

1. Downtown Street and Drainage Improvements
2. East Augusta Roadway and Drainage Improvements (8 phases)
3. Hyde Park Street and Drainage Improvements and Wilkerson Gardens
4. Old Savannah Road and Street and Drainage Improvements
5. Forest Hill Drainage Improvements and Flood Reduction
6. Heirs Pond, Lake Aumond Dredging and Restoration
7. Walton Farms Subdivision Drainage
8. Rocky Creek Flood Hazard Mitigation
9. Milledgeville Road Widening (North Leg to Barton Chapel Road)
10. Dover-Lyman Street and Drainage Improvements
11. Dennis Road Widening and Drainage Improvements
12. National Hill Area Streets and Drainage Improvements
13. Old Waynesboro and Goshen Drainage

Figure 20. Highlights of Planning Priority Capital Stormwater Infrastructure Projects

1.0 Introduction

Stormwater management includes critically important government service such as: controlling flooding, rehabilitating aging infrastructure, and maintaining water quality. These services are strongly connected with preserving property values and the quality of life enjoyed by the citizens of Augusta-Richmond County (Augusta). Proper stormwater management reduces the threat of flood damage, minimizes the overall cost of infrastructure maintenance, helps maintain Augusta's "Garden City" image, and protects the natural beauty and functionality of Augusta's water resources. While some stormwater programs address needs specific to Augusta, other stormwater services are mandated by the U.S. Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (EPD). Failure to comply with these mandates could result in a loss of state and/or federal funding and/or monetary fines.

Based on a thorough internal evaluation as described herein, the Augusta Engineering Department (AED) and the Augusta Commission determined that there were growing, real, and unresolved stormwater challenges; that the City could meet these challenges; that the cost of the local stormwater program would need to grow to an appropriate level (one commensurate with other comparable stormwater programs across the South); and that a stormwater utility fee was the preferred method of funding to provide stable, dedicated revenue to address these needs. This Business Plan outlines the process and key decision points that resulted in the conclusion that a stormwater user fee, established as a stormwater utility enterprise fund, was needed to fund an effectively maintain the stormwater infrastructure to insure long-term success.

The Business Plan presents information on the current stormwater management program, future stormwater program needs and priorities, funding approaches, and presents a framework for moving the existing program forward. A brief overview of each section is provided below.

- Section 1 presents an introduction to this report.
- Section 2 summarizes the existing stormwater management program including the staffing levels, the program functions, and information on the existing program funding.
- Section 3 of this Business Plan outlines the growing and unresolved stormwater management problems.
- Section 4 outlines the future stormwater management program staffing and funding that are needed to address the growing stormwater challenges.
- Section 5 provides a projection of the costs required to transition from the existing to the future level of services.
- Section 6 presents the basic rate methodology and identifies key policies and secondary funding methods that were deemed viable and advisable. Basic rate structure and fee calculation policies are presented.
- Section 7 includes the Rate Study that records the projected "rate base" under the recommended rate methodology and presents a detailed cash-flow analysis for the first

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five years, demonstrating the ability to meet the projected program costs.

- Section 8 describes the billing analysis including the creation of the master account file along with billing and collections policies.
- Section 9 outlines the next steps for the implementation of the proposed stormwater fee.

2.0 Augusta's Current Stormwater Program

Stormwater management includes all activities associated with the planning, construction, maintenance, and regulation of facilities which collect, store, treat, or convey stormwater and includes flood control and stream-related activities. Augusta's existing stormwater program includes maintenance, capital construction, and programmatic efforts to control flooding, rehabilitate aging infrastructure, and maintain water quality. This section outlines the existing staff, activities, and funding levels that support these stormwater activities.

2.1 Current Stormwater Staffing

The Augusta Engineering Department (AED) manages the stormwater program within Augusta-Richmond County, with the exception of Fort Gordon which manages its own municipal stormwater system. The Augusta Planning and Development Department oversees the floodplain management program that includes flood mapping and mitigation programs. AED also serves as the enforcement arm of the Augusta Flood Hazard Reduction Program.

Augusta currently has approximately 54.9 full time equivalents (FTE) dedicated to stormwater functions. This number was calculated based on the percentage of time that each of AED's 150 staff positions (filled and unfilled) and the Planning and Development Department staff typically (or would typically in the case of unfilled positions) work on stormwater issues. There are 2.1 FTEs in the Planning and Development Department and 52.8 FTEs (filled and unfilled) in the AED who are dedicated to stormwater. The number of FTEs by stormwater function are presented in Table 1.

Table 1. Augusta Staff Dedicated to Stormwater by Function

Number of Full Time Equivalent (FTE) Staff					
Administration	Engineering	MS4 Compliance	Operations & Maintenance	Floodplain Management	Total
3.1	10.3	2.0	37.5	2.1	54.9

Of these FTE positions, 10.2 FTE positions in Operations and Maintenance are currently vacant; however AED has plans to fill these positions. In addition to the staff shown above, AED currently uses inmate crews to augment department staff for maintenance. AED also manages four on-call contractors to assist with projects that AED cannot address due to staff and/or equipment limitations.

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2.2 Current Stormwater Program

Augusta's current stormwater management program focuses on the following activities:

1) Response to customer requests;
2) Compliance with Augusta's stormwater permit;
3) Maintenance of the municipal stormwater system;
4) Rehabilitation of failing infrastructure; and
5) Flood mitigation projects.

Each of these stormwater management program activities and the current level of service in Augusta are presented below.

1) **Response to customer requests.** Responding to customer concerns is a strong priority for AED. AED received an average of approximately 3,300 citizen-requested work orders per year over the past 10 years. Figure 1 shows the annual history of work orders over the past 10 years. Currently, these calls are received via Augusta 311, a countywide hotline for work orders and maintenance requests. Per AED staff, a significant number of additional requests were received directly by AED and addressed but not all of these work orders were logged. Approximately 68% of tracked citizen requests were completed by AED staff. A very small percentage (3%) of these work orders were completed by one of AED's three subcontractors. The majority of the remaining work orders (31%) include projects that are on hold because they exceed AED's current staffing and/or funding availability.

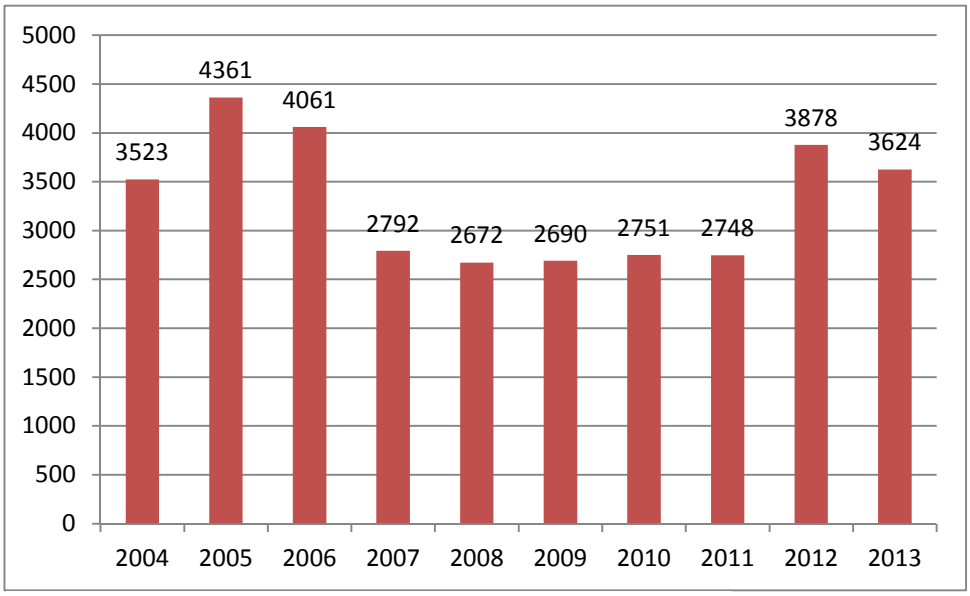

Figure 1. Number of Customer Service Requests by Year

The median time for AED to address the typical citizen request projects (for the 68% that were completed) was approximately 28 days. This timeframe excludes the requests classified as emergency projects, which were handled more expeditiously. In communities without dedicated funding for stormwater, like Augusta, it is not uncommon to see 1 to 2 year wait times for even small citizen-requested projects. The relatively low response time

to citizen requests demonstrates AED's strong commitment to serving its customers. AED has chosen to focus scarce resources on this aspect of stormwater management, which leaves other less vocally pressing needs unmet.

2) **Compliance with Augusta's Stormwater Permit.** Augusta holds a Municipal Separate Storm Sewer System (MS4) Phase I permit as part of the National Pollutant Discharge Elimination System (NPDES) program under the Clean Water Act. As part of its MS4 Permit, Augusta implements a nine part Stormwater Management Program (SWMP) and a Water Quality Monitoring Program (WQMP). These programs serve to reduce nonpoint source pollution from rainwater runoff and to assess the health of various local watersheds consistent with state and federal regulations. Augusta must submit an annual report, and permit compliance is closely enforced by the EPD. Failure to comply could result in the revocation of the permit and/or civil penalties outlined under the Clean Water Act. Augusta's stormwater program is currently compliant with the permit requirements; however, the Federal Environmental Protection Agency (EPA) and EPD are increasing the metrics and expectations of communities under the MS4 program at permit's renewal cycles. The last permit renewal for Augusta included new requirements for Green Infrastructure and Low Impact Development.

Figure 2. EnviroScape Educational Demonstration

As one part of the MS4 permit compliance, AED periodically inspects commercial and industrial facilities to ensure compliance with stormwater regulations. During the 2012 to 2013 reporting period, AED performed 69 inspections of High Visibility Pollution Sources (HVPS). AED staff use these inspections as an opportunity to educate the local business community on best practices and to protect local waterbodies from pollution. In addition, AED performed 162 outfall monitoring inspections as a way to identify potential pollution that might be entering Augusta waterbodies. As required under their MS4 permit, AED inspects all of the outfalls within Augusta-Richmond County once every five years.

3) **Maintenance of the Municipal Stormwater System.** Augusta is responsible for maintaining more than 568 miles of stormwater pipes, 731 miles of ditches, and 12,595 catch basins and more than 20,000 other components of the drainage system such as outfalls, manholes, headwalls, and junction boxes. Maintenance of Augusta's stormwater infrastructure is important to maintaining the quality of life, protecting the integrity of Augusta's infrastructure (buildings and streets), and also one component of the MS4 permit. In addition to the stormwater network, there are 896 known detention/retention ponds in Augusta; of which AED is responsible for maintaining 215 ponds and inspecting the remaining 681 ponds.

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Augusta tracks most of its maintenance activities through work orders. The work order database includes a combination of projects resulting from customer requests through Augusta 311, customer requests directly to AED, and issues identified by AED staff. Approximately 10% of the work orders completed in 2012 and 2013 addressed maintenance concerns. These typical maintenance activities include cleaning debris out of traps (also known as stormwater catch basins), repairing traps or trap lids that have been damaged, and maintaining ditches so that they flow freely. Larger projects, such as addressing pipe failures, are considered rehabilitation and discussed below. Proper preventative maintenance (addressing system needs before they become large enough to cause damage or be a nuisance) is a long term goal of the AED staff but cannot be accomplished without more resources. Preventative maintenance can greatly extend the life of the existing infrastructure and reduce the overall lifecycle cost to Augusta.

4) **Rehabilitation of Failing Infrastructure.** Eventually stormwater infrastructure will fail without a programmatic rehabilitation program, similar to a building roof, road, or other infrastructure. AED has just begun an infrastructure inventory and condition assessment program that will provide the foundation for a long-term asset management program. This program is intended to catch issues, like the Mims Road failure, before they occur and impact residents.

Figure 3. Patterson Bridge Sinkhole

Augusta is fortunate that it has enjoyed steady growth over the past 30+ years, therefore the infrastructure rehabilitation needs will likely be distributed as well. Until better data is available from the infrastructure inventory, it can be assumed that with 568 miles of stormwater pipe and an average lifespan of typical stormwater pipe of 30 years, AED would on average replace almost 20 miles of pipe annually. Other costs and needs are comparable for all parts of the system.

Figure 4. Mims Road Sinkhole

Currently, AED staffing and budgets only allow for emergency response upon failure and at a rate considerably less than 1 mile per year. Ideally, infrastructure is rehabilitated prior to

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an emergency, which minimizes the cost of the repair as well as the risk of damage to property or human life. Since the current rate of replacement is lower than the average anticipated necessary rate, there may be a surplus of infrastructure needs uncovered through the ongoing infrastructure inventory that taper into a more consistent rate in the future. A very large cost waiting to be discovered underground is anticipated, which is the cost of deferred maintenance.

AED currently oversees Capital Improvement Projects (CIPs), which are larger projects that are intended to improve the functionality of the stormwater system. Several recent CIP rehabilitation projects are listed in Table 2. These projects were funded primarily by the voter-approved Special Purpose Local Option Sales Tax (SPLOST), which is the only significant source of funding for infrastructure rehabilitation or new construction.

Table 2. Example Capital Improvement Rehabilitation Projects Funded by SPLOST (2010)

Project	Status	Year	Budget
Village West Drainage Improvements	Completed	2010	$297,102
D'Antignac Street Drainage Improvements	Completed	2010	$3,562,281
Willis Foreman Road Bridge Replacement over Spirit Creek	Completed	2010	$1,316,483
Skinner Mill Road Emergency Repair Project (culvert over Rae's Creek)	Completed	2010	$95,000
East Augusta Roadway and Drainage Improvements – Phase I	Completed	2010	$200,000
Total			$5,470,866

5) **Flood Mitigation Projects.** The Augusta Planning and Development Department has worked to update floodplain maps, notify property owners of potential flood risks, and buyout floodprone properties when appropriate. Figure 5 shows the areas currently mapped as the 100-year floodplain as well as some areas where frequently flooded homes were acquired. Over the past 12 years, Augusta has used Federal Assistance to remove 30 homes from areas plagued by repetitive flooding and is in the process of acquiring another 13 homes. There are 35 properties in Augusta-Richmond County in floodprone areas that are currently targeted for acquisition, having collectively experienced 89 repetitive flood losses. There are a total of 107 properties eligible for acquisition.

To reduce the risk of future flooding, the Augusta Planning and Development Department endeavors to keep new developments out of the currently known floodprone areas and heavily enforces associated stormwater regulations. Additionally, AED requires new developments to manage their stormwater runoff in a manner that minimizes the threat to downstream property owners.

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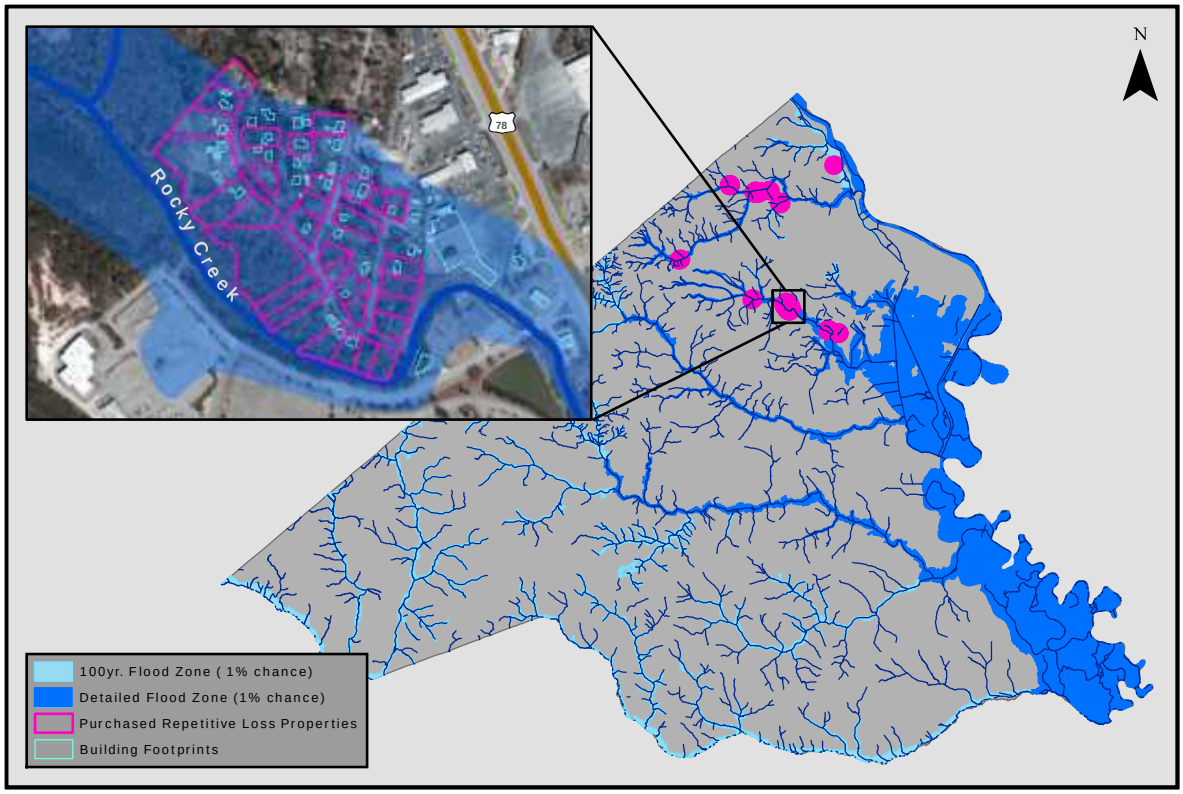

Figure 5. Floodprone Areas in Augusta-Richmond County

Figure 6. 1990 Flooding Event

2.3. Current Stormwater Funding

Augusta's current stormwater program costs just over $10 million, to support the staff identified in Section 2.1 and implement the programs described in Section 2.2, on a typical year. The primary sources of funding are shown for a typical year in Table 3.

Table 3. Current Stormwater Program Costs and Funding Sources

Total Stormwater Program Cost	**$10,480,000**
Revenue from NPDES Permit Fees	$15,000
Revenue from SPLOST - Salaries & Benefits	$820,000
Revenue from SPLOST - Vehicle Cost Allocations	$760,000
Revenue from SPLOST - Consulting/Contracting	$1,000,000
Revenue from SPLOST - Capital Infrastructure Projects	$5,000,000
Revenue from General Fund	$2,885,000

The stormwater program costs were calculated by reviewing budget documents, indirect cost allocation information provided by the Finance Department, and determinations of the percentage of time staff currently work on stormwater-related tasks (versus street maintenance, plan review, etc.). Table 3 shows that over $7.5 million of the current program costs (or almost 75%) are funded by SPLOST revenues. These revenues are subject to the local economy (sales taxes collected) and also voter referendum and therefore not a permanent source of funding.

Currently, General Fund provides approximately $2.885 million in funding for stormwater programs. If the SPLOST funds were not available, AED would only have sufficient funds to comply with the minimum Federal permit requirements and would not be able to support customer concerns, maintenance, or system rehabilitation. While SPLOST funds are important, they cannot be relied on year to year to fund a sustainable stormwater program. The current funding program is not seen as sustainable to meet the community's needs.

3.0 Augusta's Stormwater Challenges

AED has a stormwater management program that maximizes limited funding and is effective in the short term; however there are growing and unresolved stormwater challenges facing Augusta. They are put off year to year. Unlike other infrastructure, stormwater issues are not readily apparent until it rains. The system's inadequacies are only apparent when tested by a storm for which the system should be designed, and the system fails.

These stormwater challenges, if not addressed, will increasingly impact the current quality of life and AED's ability to quickly resolve citizen requests. For example, there will be an increasing risk of some damaging event such as a roadway collapse, dangerous roadway flooding, or flash flooding in neighborhoods or commercial areas.

These stormwater challenges have been grouped into four main categories; flooding, degrading infrastructure, preserving the quality of life, and maintaining water quality. These four stormwater challenges and supporting evidence are presented in this section.

3.1 Flooding

Flooding is an ever present threat that is only recognized when it rains. Due to geography and

topography, some areas of Augusta are prone to flooding. As a result, there are records of damaging flood events dating back to 1888. Some of the worst flooding in recent history includes the October 12, 1990 flood following 15-inches of rainfall that resulted in millions of dollars of property damage and flooding of Gordon Highway. Other areas that experienced significant flooding were: Laney Walker at Fair Ground area and Medical District; Old Town; Downtown; National Hills area; Forest Hills area; Steiner Ave; and the East Augusta area.

Figure 7. Flooding of Gordon Highway (1990)

The Augusta Planning and Development Department has worked to update floodplain maps, notify property owners of potential flood risks, and even buyout floodprone properties. As noted previously, with Federal assistance, Augusta has been able to remove 30 homes and properties from harm's way from repetitive flooding and is in the process of acquiring another 13 homes. However, there are still more than 107 properties in Augusta-Richmond eligible for acquisition and 35 properties that have experienced repetitive flood losses. Additional funding could help protect Augusta residents and fund projects to manage stormwater in a way that minimize flood impacts and protect neighbors from repetitive losses.

While the catastrophic flooding above gets more media coverage, routine nuisance flooding also impacts the quality of life and safety of transportation corridors in Augusta. More frequent maintenance of the stormwater system such as removing debris from ditches, pipes, and traps can often address nuisance flooding issues. While AED currently performs these activities, their current maintenance program can only handle addressing customer requests. Therefore, damage has to already have happened or be imminent for Augusta to be able to respond. Hiring additional staff that could be dedicated to routine preventative maintenance would allow AED to address citizen requests as well as catch potential flooding problems before they happen. For example, AED has a proactive program to dredge several lakes in the Augusta Canal Basin to maintain storage volume for peak rainfall. AED has also identified a capital program to construct flood reduction projects in the Rocky Creek Basin.

Figure 8. Flooding in Downtown (1888)

The Planning and Development Department oversees Augusta's participation in the FEMA Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum requirements under the National Flood Insurance Program (NFIP). In exchange for a community's proactive efforts to reduce flood risk, policyholders can receive reduced flood insurance premiums for buildings in the community.

By participating in the CRS, communities can earn credit points that determine classifications. There are 10 CRS Classes: Class 1 requires the most credit points and provides the largest flood insurance premium reduction (45 percent), while Class 10 means the community does not participate in the CRS or has not earned the minimum required credit points, and residents receive no premium reduction.

Augusta is a CRS Class 10 community indicating that the City is meeting the minimum requirements to be included in the CRS program. Augusta performs creditable activities under the CRS program and could lower the CRS rating but a commitment of funding and staff resources is needed to document activities and migrate through the FEMA process to be reevaluated. Additional funding for the stormwater program would provide AED with the resources necessary to achieve a CRS Class 8, or lower, which would qualify flood insurance policy holders for a 10% reduction in annual premiums. Additionally, communities that are more active in the CRS program, as evidenced by their CRS Class, and that have adequate financial resources are in a better position to leverage local funding and secure grants for flood control projects.

In 2014, it is reported that there are 1,184 policyholders in Augusta-Richmond County carrying more than $233 million in flood insurance. A CRS Class 8 would allow policyholders to receive a 10% discount on flood insurance premiums. Expanding and adopting new programs to decrease the flood risks in Augusta, could lead to an even lower CRS rating. More than 35 communities in Georgia are a CRS Class 8 or lower. Six (6) Georgia communities are a CRS Class 6 or lower, which provides at least a 20% reduction in flood insurance premiums.

3.2 Degrading Infrastructure

Augusta knows that it has an aging stormwater system but has only an incomplete inventory of its current condition. AED is responsible for maintaining the stormwater infrastructure that serves the public right-of-way and is responsible for inspecting infrastructure that is classified by the state as part of the Municipal Separate Storm Sewer System (MS4). The stormwater system includes numerous features that must be maintained in order for the system as a whole to function as designed. AED is currently conducting an inventory of the stormwater infrastructure system. Thus far, the stormwater infrastructure inventory includes:

- 12,595 catch basins,
- 731 miles of ditches,
- 568 miles of storm drain lines,
- 681 detention/retention ponds inspected by AED,
- 215 detention/retention ponds maintained by AED, and

- more than 20,000 system components such as junction boxes, manholes, headwalls, and outfalls.

While the stormwater infrastructure inventory is ongoing, there is no comprehensive understanding of the age or status of individual components and little is done on the system absent a complaint or a catastrophic failure.

Theoretically, 172 miles of pipe in Augusta have exceeded its expected life and may need rehabilitation (as estimated in Table 4). The true extent of degradation of the system is not known until a large failure occurs, since the majority of the system is underground. The ongoing infrastructure inventory will provide more accurate estimates of the pipeline rehabilitation needs and serve as the start of a stormwater asset management program. If these estimates are correct, the cost of replacement is estimated at $2.2 million per mile of pipe[1] for an 18-inch diameter pipeline and up to $8.8 million per mile of pipe for a 60-inch diameter pipeline. This could represent $378 – $1,513 million in future pipe replacement costs.

AED has already identified approximately $240 million in capital improvement projects. Of these projects, about $100 million are considered “high priority” or “urgent” projects and the remaining $140 million are medium to low priority projects. Currently, these projects are funded at a rate of $3 - $5 million per year through the voter-approved SPLOST program. At that rate, it would take more than 50 years to complete these projects – assuming no new projects were identified during that timeframe. This is clearly not a sustainable program.

Figure 9. Colony Park Culvert Collapse

[1] Adapted from Governor’s Water Contingency Planning Task Force. Appendix 1. 02/23/2010.

Table 4. Estimate of Pipeline Needing Replacement

Year	Total Pipe (Miles)	Estimated Pipeline Replacement Needs (miles)*	Actual Miles of Pipe Replaced (miles)**	Cumulative Estimate of Pipeline to be Replaced (miles)
2004	521.9	17.4	1	16.4
2005	527.2	17.6	1	33.0
2006	532.5	17.8	1	49.7
2007	537.9	17.9	1	66.6
2008	543.3	18.1	1	83.8
2009	548.8	18.3	1	101.1
2010	554.3	18.5	1	118.5
2011	559.9	18.7	1	136.2
2012	565.6	18.9	1	154.0
2013	568.0	18.9	1	172.0

* Assumed a 30 year lifespan for all pipelines.
** Estimated 1 mile of replacement per year as data not tracked. Per AED, significantly less pipeline was actually replaced.

3.3. Preserving Property Values

Augusta takes great pride in being known as the "Garden City," and citizens take pride in preserving their property values and maintaining their neighborhoods. This pride is evident through the type of citizen requests received by Augusta. Over half of the citizen-requested work orders over the past 10 years are tied to preserving property values. These activities include mowing right-of-way areas, trash cleanup, and addressing unsightly erosion. Activities such as mowing and trash removal improve property values and the aesthetic of neighborhoods and public spaces.

Figure 10. Augusta Riverwalk Represents the "Garden City"

As the demands of aging infrastructure and routine maintenance increase, the ability of AED to respond to property value needs will likely decrease under existing staff and funding levels.

With the current funding structure, AED is not able to provide the level of mowing and swale maintenance that citizens would like.

3.4. Maintaining Water Quality/Ecology

Maintaining the kind of water quality that supports recreation such as fishing and swimming is important to the community and also tied to regulatory compliance. Two streams in Augusta currently have elevated levels of bacteria that may present health risks for recreation; Butler Creek from Phinizy Ditch to the Savannah River and Rocky Creek from SR56 to below New Savannah Road.

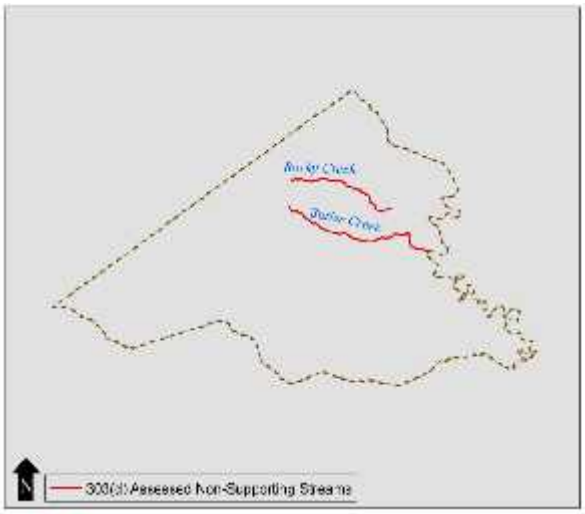

Figure 11. Impaired Waters

Some communities, such as those in the Chesapeake Bay or Atlanta, have faced significant and expensive regulatory mandates. Proactive management of the small water quality issues in Augusta can avoid the potential for regulatory interference later.

Additional funds will allow AED to better address sources of water quality pollution in order to create and maintain safe bodies of water. Some of the priorities for Augusta would include better water quality and rainfall monitoring to allow Augusta to focus stormwater improvement efforts and work with the state on removing waterbodies from the impaired list of waters. Clean waterbodies preserve property values and provide opportunities for recreation in Augusta.

4.0 Future Stormwater Program – Addressing the Growing, Real, and Unresolved Problems

AED has developed a plan to address the stormwater challenges outlined in Section 3 that builds upon the foundation of the current stormwater program, outlined in Section 2. This section outlines the plan to elevate the existing tasks and activities and the corresponding funding needs as it relates to staffing, the program activities, and funding.

The future planned program is not, in any sense, an extravagant plan. It does however provide what is felt to be a proper balance between minimizing both stormwater damage and stormwater program cost. As such, the program when compared to others is moderate in its scope and cost yet felt to be effective in both its planned growth and ultimate configuration and capability.

4.1 Future Stormwater Priorities

Priorities for the future stormwater program were developed based on the stormwater challenges facing Augusta that are outlined in Section 3. The following three priorities will be the focus for the future stormwater program enhancements:

1) **Manage Augusta's Stormwater Assets in a Sustainable Manner.** AED wants to develop a sustainable asset management program that minimizes the necessary expenditures on maintaining stormwater assets in a manner that reduces their lifecycle costs. This focus includes collecting and maintaining the information needed to support sound asset management decision making. Sufficient staff and funding to perform routine maintenance is critical to addressing this priority.
2) **Protect Health, Safety, and Well Being of the Community.** Proper stormwater planning and management can reduce the risk of flooding events that impact residents and businesses. Impacts from flooding can range from reduced safety resulting from ponding on local streets to the inundation of family homes. Addressing areas where the stormwater pipes are not properly sized to handle storms and performing routine maintenance to keep the system working as designed are critical to protecting the community.
3) **Support Realization of the Garden City.** The phrase "realize the Garden City" was coined as part of Augusta's 2010 Sustainable Development Agenda. As it relates to stormwater, this means addressing customer concerns in a reasonable timeframe. This also includes promoting green infrastructure, as well as maintaining a routine schedule for street sweeping, right-of-way maintenance, and fixing trap lids.

These priorities shaped the recommended increase in staffing, operational costs, and capital improvement expenditures.

4.2 Future Stormwater Management Program

AED has a plan to address the growing and unresolved stormwater problems facing Augusta that are outlined in Section 3 that build on the priorities identified in Section 4.1. This section outlines the proposed changes to the existing stormwater program that are intended to address these unresolved challenges. These objectives will be seen as improvements to the five program areas described below:

1) Response to customer requests;
2) Compliance with Augusta's stormwater permit;
3) Maintenance of the municipal stormwater system;
4) Rehabilitation of failing infrastructure; and
5) Flood mitigation projects.

The recommended types and levels of service for each of these stormwater management program activities are presented below.

1) **Response to customer requests.** Responding to customer concerns will remain a strong priority for AED. In the future, AED would like to maintain one crew dedicated exclusively to addressing customer concerns. The benefits associated with the assigned crew include:

    - *Improved Communications*. The crew leader assigned to the customer response crew will also serve as the customer response liaison. Streamlining communications

will improve responsiveness and understanding, as well as improve communications with Augusta 311.

- *Consistent Project Evaluation*. The crew leader as the customer response liaison will evaluate the request, determine the best resolution, and rank the request's priority relevant to other requests. This will help ensure that the most important projects (those that threaten health and safety) are addressed first.
- *Coordinated Responses with Routine Maintenance*. The crew leader will also coordinate the customer requests with the new maintenance program outlined below. For example, if the maintenance crew is scheduled to maintain the right of way the following week, the customer request crew leader will be able to convey the timing of the planned activities to the customer.
- *Greater Efficiency***.** With one crew dedicated to mobilizing to respond to customer complaints, the rest of the crews can operate efficiently without costly and time consuming deployment around the County.

The proposed programmatic approach to maintenance may reduce the number of customer requests over time. If customer requests demand additional staff, the customer service crew leader will coordinate with the other crew leaders for support.

2) **Compliance with Augusta's stormwater permit. A**ugusta does a good job maintaining compliance with their MS4 permit. There are no enhancements recommended to this program at this time. AED will continue to perform inspections needed to comply with their MS4 permit as these are an important aspect of preserving water quality.

   However, it is important for AED to maintain communications with EPD and stay ahead of emerging regulations. Proactive response to emerging regulations may allow Augusta the opportunity to dictate the requirements instead of reacting to the state-mandated priorities. As the program evolves, Augusta may also be able to negotiate permit requirements that align better with the new program. For example, some communities have negotiated an increase in stormwater system inspections as part of their asset management program in lieu of inspections of outfalls. AED will continue to comply with the existing permit and look for opportunities to streamline requirements.

3) **Maintenance of the municipal stormwater system.** AED would like to make significant changes to the existing stormwater maintenance program. The current maintenance program is not programmatic as it is only reactive to customer requests. AED would like to develop a programmatic asset management program that includes scheduled ditch maintenance and mowing, street sweeping, trap cleaning, and other related maintenance.

   Currently, AED has 37.5 budgeted FTE positions dedicated to stormwater operations and maintenance. However, 10 of these FTE positions are currently funded by SPLOST revenues which means that these funding levels are subject to voter referendum and the expected revenue levels that result from a strong economy. These SPLOST funded positions are currently vacant. To implement the proactive maintenance program, AED

would like to hire 24 new operations and maintenance staff, which includes the 10 vacant SPLOST positions (which will be funded by the proposed stormwater fee) and 14 new positions. In the first few years of the stormwater fee, AED will use on-call contractors to perform maintenance while staff are hired and equipment purchased. After staff are hired, the on-call contractors will be used for larger and more complex rehabilitation, as outlined below.

Routine maintenance will include programmed ditch maintenance and mowing to keep water flowing. An increase in the frequency of street sweeping has also been requested both in neighborhoods as well as the downtown area. Trap cleaning and small pipe maintenance projects can also reduce localized flooding problems.

4) **Rehabilitation of failing infrastructure.** While the extent of the rehabilitation needs is currently unknown; there are periodic roadway collapse sinkholes that demonstrate the damage associated with failures of the aging stormwater pipe system. AED is currently performing a system-wide condition assessment. This project will rank the quality of the infrastructure within Augusta and allow AED to prioritize future rehabilitation projects. SPLOST is still intended to provide the bulk of the future capital improvement project funding at an anticipated rate of $5 million per year. AED has identified a backlog of $240 million of capital projects and will likely uncover more rehabilitation needs through the ongoing inventory.

   Rehabilitation projects can be divided into two categories; small to medium sized projects and large projects. AED currently performs the small projects and uses one of three on-call contractors for the medium-sized projects. In order to more efficiently address the backlog, AED would like to maintain consistent funding of at least $3 million per year in addition to the SPLOST funds and double the number of contractors available to support projects. As noted above, the SWU funds will initially be used to “catch up” on routine maintenance and, as staff are hired, will shift to small and medium rehabilitation projects.

   In addition to the contract services for rehabilitation, AED needs $500,000 annually for pond and ditch maintenance. AED is responsible for maintaining 215 ponds but does not have dedicated funding to do so.

   For the larger capital improvement projects, the future cost of service includes an annual budget of $5 million from SPLOST revenues. Currently, SPLOST provides funds for funds staffing, maintenance, and rehabilitation. With dedicated funding for staffing and maintenance, SPLOST funds will assist with addressing the current $240 million project backlog. The cost of service projection anticipates maintaining the current SPLOST funding level of $5 million per year.

5) **Flood mitigation projects.** Flooding in Augusta-Richmond County may be mitigated by the planned maintenance and capital improvement projects that are mentioned above. In addition, the Planning and Development Department will continue to leverage federal funding and assist Augusta residents who suffer from repetitive flooding. The flood mitigation projects to date have focused on acquisition of flooded properties for conversion

into greenspace. The greenspace provides additional flood attenuation and an amenity to the community. SPLOST funds will continue to be requested for flood and hazard mitigation projects to keep Augusta residents safe. In addition, there is ongoing joint effort between USACE and Augusta to complete comprehensive flood reduction study in several drainage basins and develop warranted control measure to reduce flooding impact.

4.3 Future Stormwater Staffing

Based on the challenges outlined in Section 3 of this report and the key objectives listed above, AED, working with other departments, has developed a vision for effective and controlled growth of the stormwater program to address these challenges. In support of the identified program objectives, AED staff have carefully planned for necessary new equipment, staff, and funding. Table 5 summarizes the current staffing by functional area as well as the planned staffing levels, five years following the collection of stormwater utility funds. The staffing increases are spread throughout this 5 year period. In addition to the salaried positions shown below, AED currently uses inmate crews for some activities. As a cost-effective solution for some maintenance activities, AED plans to increase the support from inmate crews from the 20 inmates used currently to 30 inmates in Year 5.

Table 5 shows that most of the new staff will be in AED's Operations and Maintenance group. These additional AED operations and maintenance staff will focus on routine maintenance of the stormwater system, small rehabilitation projects, and help maintain the current levels of customer response. The additional staff person in the Administration function will be assigned to customer service support. The Engineering staff person will assist with data management and mapping associated with the ongoing stormwater infrastructure inventory, provide other engineering support, and supplement customer service support, as needed. The 0.5 FTE floodplain management staff is to augment the Planning and Development department. The hiring of these positions will be spread over the 5 year timeframe and contract services for operations and maintenance may be used as an interim measure until the staffing levels are reached.

Table 5. Future Planned Augusta Staff Dedicated to Stormwater by Function

Staffing	Number of Full Time Equivalent (FTE) Staff					
	Administration	Engineering	MS4 Compliance	Operations & Maintenance	Floodplain Management	Totals
Existing	3.1	10.3	2.0	37.5	2.1	54.9
Future (Year 5)	4.1	11.3	2.0	56.5	2.6	76.4
Change	1	1	0	14	0.5	16.5

4.4 Future Stormwater Funding

In order to accommodate the increased level of service and address the unresolved stormwater problems in Augusta, the future program in Year 5 shows a funding need of $19 million. The primary sources of funding are showing in Table 6.

Table 6. Future Stormwater Program Costs and Funding Sources (Year 5)

Total Stormwater Program Cost	**$19,020,000**
Revenue from NPDES Permit Fees	$15,000
Revenue from SPLOST - Salaries & Benefits	$0
Revenue from SPLOST - Vehicle Cost Allocations	$0
Revenue from SPLOST - Consulting/Contracting	$0
Revenue from SPLOST - Capital Infrastructure Projects	$5,000,000
Revenue from Stormwater Utility	$14,005,000

While Table 6 reflects the costs associated with the future, enhanced stormwater program; the stormwater utility must also accommodate the cost of billing, indirect cost allocations, bad debt, credits, and reserves. Therefore, the total revenue generated by the utility will be higher than Revenue from Stormwater Utility in Table 6. The future funding sources show a more balanced funding approach with 25% to 30% of the total program costs funded by SPLOST; compared to the existing program in which 75% of the program costs are funded by SPLOST.

A more detailed cost of service analysis is outlined in Section 5, showing the annual cost and funding sources as well as a description of the methodology used to calculate these program costs. Section 6 of this Business Plan outlines the proposed stormwater user fee in greater level of detail.

5.0 Cost of Service Analysis

The Cost of Service (COS) Analysis presents, in moderate detail, the costs associated with providing stormwater services in Augusta. The current COS is based on the current funding sources and stormwater-related activities as outlined in Section 2.0. The future COS presents the costs for the future stormwater program that was outlined in Section 4.0, along with the annual costs for the first 5 years of the program. Section 6.0 outlines the rate structure analysis and fee calculation policies recommended to grow the stormwater funding levels to meet this anticipated cost of service.

5.1 Cost of Service

The cost of service (COS) subdivides the cost of providing stormwater services into total labor costs, expenses, other non-labor costs, and capital improvement costs. The COS (Table 7) includes the current program cost of service as well as the estimated costs associated with the first 5 years of the future stormwater program. The calculations used to derive each component of the COS are outlined in more detail in Table 8, corresponding to the row in Table 7.

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Table 7. Stormwater Program Cost of Service Summary

			Program Years				
1	Item	Current	1	2	3	4	5
2	Salary	$2,060,000	$2,210,000	$2,360,000	$2,570,000	$2,730,000	$2,790,000
3	Fringe Costs	$620,000	$660,000	$710,000	$770,000	$820,000	$840,000
4	Total Labor	$2,680,000	$2,870,000	$3,070,000	$3,340,000	$3,550,000	$3,630,000
5	Indirect Cost Allocations	$320,000	$1,380,000	$1,400,000	$1,540,000	$1,570,000	$1,620,000
6	Consulting/ Contracting	$160,000	$170,000	$180,000	$190,000	$200,000	$200,000
7	Vehicle Cost Allocations	$770,000	$860,000	$950,000	$1,100,000	$1,170,000	$1,210,000
8	Fuel	$120,000	$140,000	$150,000	$170,000	$180,000	$190,000
9	Utilities	$60,000	$70,000	$70,000	$80, 000	$80,000	$90,000
10	Landfill Fees	$30,000	$40,000	$50,000	$60,000	$60,000	$60,000
11	Other	$90,000	$150,000	$160,000	$170,000	$180,000	$190,000
12	Total Non-Labor	$1,550,000	$2,810,000	$2,960,000	$3,310,000	$3,440,000	$3,560,000
13	Operations Costs (Labor + Non-Labor)	$4,230,000	$5,680,000	$6,030,000	$6,650,000	$6,990,000	$7,190,000
14	Consulting/ Contracting	$1,250,000	$3,910,000	$4,710,000	$4,710,000	$4,360,000	$4,260,000
15	Equipment	$0	$2,010,000	$950, 000	$1,970,000	$620,000	$570,000
16	Flood Buyouts	$0	$0	$0	$0	$0	$0
17	Capital Improvement Projects	$5,000,000	$5,030,000	$5,000,000	$5,000,000	$6,000,000	$7,000,000
18	Total Capital Expenses	$6,250,000	$10,950,000	$10,660,000	$11,680,000	$10,980,000	$11,830,000
19	Total Stormwater Program Costs	$10,480,000	$16,630,000	$16,690,000	$18,330,000	$17,970,000	$19,020,000

Table 8 summarizes the methodology and rationale used to develop the stormwater program cost of service presented in Table 7. Most costs were escalated at a rate of 3% per year to account for possible inflation.

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Table 8. Summary of the Stormwater Program Cost of Service Calculation by Row

Line Number	Notes
2	Salary costs are presented for the FTE's dedicated to stormwater management. Existing staff salaries (FY 2014) were used for current employees and vacant staff positions. Salaries for future staff positions were estimated based on comparable salaries for similar positions. The total salary costs reflect the percentage of time each staff person spends or will spend on stormwater management activities. For example, a $40,000 per year salaried employee that works on stormwater 50% of the time would be represented as $20,000 of salary cost. Salaries include an annual escalation rate of 2% based on input from the Finance Department. A staffing plan is presented in Section 5.2.
3	Fringe benefits were assumed to be 30% of raw staff salaries based on guidance by the Finance Department. Fringe benefits increase at a corresponding rate to the salary increase of 2% per year.
4	Total labor costs are the sum of the labor costs and fringe costs listed in lines 2 and 3.
5	Indirect costs reflect shared Augusta services such as human resources, administration, information technology, legal and others that provide services to multiple Augusta departments. Annually, the Finance Department completes a Full Cost Allocation Plan that assigns the appropriate portion of these shared costs back to each of the cost accounting centers. With assistance from Finance, the indirect cost allocations for all of AED's cost accounting centers were summed. To determine the total indirect cost allocation associated with stormwater functions, a per-employee indirect cost allocation was calculated and then applied to the existing number of FTEs associated with stormwater functions. The future indirect cost allocations were estimated by multiplying the existing per employee indirect cost allocation to the total number of stormwater staff in the future. Therefore, the indirect cost allocations increase as the FTE assigned to stormwater increases. Note that the indirect cost allocation per employee was based on data for AED. Due to the low number of FTE from other departments, the AED indirect cost allocation per employee was applied to all future FTEs. The future indirect cost allocations also include a Franchise Fee that is 3.5% of the revenue of the stormwater utility that will be assessed. Additionally, this category includes the Payment in Lieu of Taxes (PILOT) that will be assigned by the Finance Department. The PILOT is estimated at one-third of the payment assessed to the Augusta Utilities Department because the stormwater system has fewer assets than the water and sewer systems.
6	The Non-Labor Consulting/Contracting services include a number of smaller contracts, many of which are tied to Augusta's MS4 permit compliance including laboratory analysis costs and other small contracted services. These costs reflect AED's 2014 budget request. As appropriate, costs that are tied to staffing levels, such as copy services, received small increases to reflect the planned increases in staff.
7	Vehicle cost allocations from AED's 2014 budget request were converted to a per FTE basis. This cost per FTE was then multiplied by the number of FTEs to obtain cost per year estimates.
8	Fuel costs from AED's 2014 budget request were converted into a per vehicle basis. This cost per vehicle was then multiplied by the numbers of vehicles to obtain cost per year estimates.
9	Utilities costs from AED's 2014 budget request were converted into a per FTE basis. This cost per FTE was then multiplied by the numbers of FTEs to obtain cost per year estimates.
10	Landfill fees from AED's 2014 budget request were converted a per FTE basis. This cost per FTE was then multiplied by the numbers of FTEs to obtain cost per year estimates.

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Line Number	Notes
11	The "other" non-labor costs include training, hardware and software, and a grouping of other small budget line items. The per capita costs for the "other" non-labor costs were applied to new staff added to each functional area.
12	Total non-labor costs are the sum of the expenses listed in lines 5 through 11.
13	Total operations costs are the sum of expenses listed in lines 4 and 12.
14	Operations consulting/contracting services were estimated based on existing contracts and planned future needs for services. The existing contracted services include those associated with the infrastructure inventory and on-call stormwater maintenance and rehabilitation needs. The future contracts plan for increased levels of maintenance and rehabilitation, street sweeping, and estimates for other contracted programmatic services.
15	The equipment includes vehicles and other equipment that are needed to support the stormwater functions. An inventory of the vehicles that need replacement and new equipment needed for the planned additional staff are summarized in Section 5.3. The replacement frequency for vehicles was estimated at 10 years and the replacement frequency for equipment was considered to be 15 years. The costs show the cost per year for vehicles needed to transport new staff positions as well as the replacement of aged vehicles. The cost also includes a baseline replacement costs that is the sum of one-tenth of the cost of the vehicles and one-fifteenth of the cost of the equipment on an annual basis.
16	The Planning and Development Department leverages grant funding from the Federal Emergency Management Agency to acquire floodprone properties. In the past, the SPLOST program has included matching funds for these acquisitions. This funding is not reliably allocated and therefore not included. Opportunities to leverage grant funding, however, will be carefully considered through the annual stormwater utility budget process.
17	Currently AED receives about $5 million in funding annually from SPLOST for large capital improvement projects. This funding level is expected in the future to address the $240 million backlog of projects. These funds are anticipated to continue to fund projects that address the backlog of capital improvement needs.
18	Total Capital Expenses include the expenses listed in lines 14 through 17.
19	Total Stormwater Program costs include the sum of lines 13 and 18.

5.2 Staffing Plan

The future stormwater management program, outlined in Section 4, outlines the need to increase the staff focused on stormwater system maintenance. These staff are reflected in the cost of service presented in Table 7. The staffing plan presents more detailed information on the type of staff to be hired and when the hiring is planned within the cost of service. Table 9 provides a summary of this staffing plan.

Table 9. Staffing Plan for the First 5 Years

Year	Department	Staff Addition	Percent Time Dedicated to Stormwater	Purpose
Administration				
1	Augusta Utilities Dept.	Customer Service Representative	100%	Customer Service Calls
Engineering				
1	Engineering	GIS Specialist	100%	Work Order System & Infrastructure Inventory
MS4 Compliance				
No new staff recommended.				
Operations & Maintenance				
2	Engineering	Maintenance Crew - Leader	100%	Increased Maintenance Program Support
2	Engineering	Maintenance Crew - Driver	100%	
2	Engineering	Maintenance Crew - Operator	100%	
2	Engineering	Maintenance Crew - Worker	100%	
2	Engineering	Inmate Crew - (5 members)	100%	
3	Engineering	Gradall Crew - Driver	100%	
3	Engineering	Gradall Crew - Driver	100%	
3	Engineering	Gradall Crew - Operator	100%	
3	Engineering	Gradall Crew - Worker	100%	
3	Engineering	VacCon Crew - Driver	100%	
3	Engineering	VacCon Crew - Operator	100%	
3	Engineering	Street Sweeper - Operator	100%	
3	Engineering	Inmate Crew - (5 members)	100%	
4	Engineering	Grading/Concrete Crew - Driver	100%	
4	Engineering	Grading/Concrete Crew - Operator	100%	
4	Engineering	Grading/Concrete Crew - Worker	100%	
Floodplain Management				
1	Planning & Development	Planner	50%	Hazard Mitigation & Floodplain Management

5.3 Vehicle and Equipment Plan

Most of the new staff proposed for the stormwater utility will require vehicles and/or equipment to properly perform their jobs. Additionally, AED staff has identified a number of vehicles and equipment that are overdue for replacement. Currently, AED must participate in a lottery with other Augusta departments with limited funds available for vehicle and equipment replacement. Table 10 presents the vehicle and equipment budget for the first 5 years of the stormwater utility.

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Table 10. Vehicle and Equipment Budgets by Year

Year	Vehicle Budget	Equip Budget	Total Budget
1	$1,523,167	$486,833	$2,010,000
2	$390,767	$559,233	$950,000
3	$1,521,767	$448,233	$1,970,000
4	$188,767	$431,233	$620,000
5	$138,767	$431,233	$570,000

6.0 Rate Structure Analysis

This Rate Structure Analysis (RSA) defines the basic rate structure, which determines how much each property pays. The rate structure analysis, approved by AED staff, includes basic rate structure policies along with examples of the rate methodology as applied to different classes of stormwater users.

Utilities are generally funded by an independent revenue stream that is dedicated to a specific purpose; such as water supply, wastewater treatment, solid waste management, or stormwater management. Service fees are the primary source of revenue for utilities. Service fees are calculated following an adopted methodology that is based on a customer's use of the utility service. In the case of stormwater services, the user fee recognizes that properties use the stormwater system to discharge runoff, to protect their property from flooding, and to provide safe streets, clean water, and comply with stormwater regulations. The stormwater system is a public system that carries away runoff from both public and private properties.

6.1 Rate Structure Components and Policy Decisions

The rate structure is the framework that describes how much each property is charged and on what basis. The rate structure is unique to each utility and divided into three modules:

- Basic rate methodology;
- Modification factors, which can be applied to any of the rate concepts to enhance equity, reduce costs, and meet other objectives; and
- Secondary funding methods that can be adopted in concert with the service charges.

Rate structures are customized to each utility and the differences between rate structures reflect local conditions. Local conditions include size of service area, number and age of stormwater system components, program goals or priorities, the influence of other policy objectives such as growth management or economic development, technical constraints, or the availability of resources like geographical information systems (GIS) or other databases.

A key attribute of utility service fee funding is that the Augusta-Richmond County administration has broad authority to design its rate methodology to fit local circumstances and practices and to achieve the desired allocation of the cost of services and facilities. There are no specific rules or proscriptions though there are legal guidelines and precedent that frame the range of potential decisions within bounds. This analysis presents a rate structure tailored to the

Augusta milieu based on guidance from AED to reflect the character and desires of Augusta-Richmond County balancing the following considerations:

1) The rate structure should be fair and reasonable, which is normally expressed in two ways:
    - The basis for the rate (basic rate methodology) and the specific costs allocated to a property owner should be substantially related to a parcel's use of the stormwater system and of Augusta's services. There should be a rational nexus between the two.
    - Similarly situated properties should be treated in a consistent manner in terms of the relationship between fees paid and services received and differences should be treated in a proportional manner.
2) The rate structure should not be illegally discriminatory or confiscatory.
    - All rate structures legally discriminate. Larger and more impacting property classes pay more, for example, but there should not be a differing charge or service level based on factors that are unrelated to use of the system and services.
    - There should be reasonable options for the use of personal real property despite rate structure or other policy limitations.
3) There should be a reasonable "opt out" provision by which a property owner can take personal actions to reduce their stormwater bill. This is normally handled by a credit program.
4) Regardless of an expressed or observed need, the program components and rate reflected by those components should stay within Augusta's authority as defined by state law. Proper procedures associated with "sunshine" laws must be followed for certain meetings, public hearings, voting, etc.

6.1.1. Basic Rate Methodology

The basic rate methodology defines the basis for the rate that users will be paying. The three main impacts of urban development on surface water are increases in: peak flow, volume of discharge, and amount of pollution. All other impacts can fit into these three basic categories. The variable most positively associated with increases in these three impacts is the conversion of pervious areas to impervious areas. Accommodating the runoff that occurs when a pervious area that typically absorbs rainwater is converted to impervious area requires Augusta to invest in the public drainage system. Therefore, it is appropriate to use some measurement of impervious area, or surrogate of impervious area, in the rate methodologies.

Many stormwater programs have used impervious area as the only factor for rate calculation. While impervious area does not directly account for all of the stormwater program costs, urbanization of land as reflected in intensity of development is, by far, the best measure of cost causation and provides a court-tested rational nexus for the fee amount on any property.

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There are other ways to configure the rate methodology in order to emphasize other impacts, class differences in property development, or to recognize the benefits of certain kinds of development practices. Many of these considerations are handled with a stormwater crediting or secondary funding system, but some factors can also be handled in the makeup of the basic rate methodology itself. Common basic rate methodologies include:

1. Fees based on impervious area only;
2. Fees based on gross parcel area in addition to impervious area;
3. Fees based on an intensity of development factor – so that the same amount of imperviousness would be charged less if it were located on a larger lot with more green space; and
4. Billing on the basis of an estimate of total runoff through the use of a weighted runoff factor, such as an NRCS curve number, calculated for each parcel.

Various rate methodology options were discussed and demonstrated with AED staff. After thorough discussion, AED staff felt that it was improvements to vacant land and the resulting increases in stormwater flow that produced the need for construction and operation of the public drainage system; therefore, vacant land should not be charged for its runoff. The charge is for increases in runoff due to development above the vacant land (be it agricultural or simply grass or forest). Distinguishing among various types of vacant land was not considered to be a key factor in cost causation at this time.

> ***Augusta shall use impervious area as the basis for the stormwater charge and make adjustments to account for other unique aspects of a particular parcel of land through rate modifiers.***

Equivalent Residential Unit (ERU) and Charges

Impervious area was chosen as the basis for the stormwater fee and the next step was to identify the unit of impervious area measurement that will be the basis for the customer charge. Similar to water and power utilities, the stormwater utility charge has a base unit. For example, the base unit for electric utilities is the kilowatt hour. For the stormwater utility, one approach to the base unit is to use the Equivalent Residential Unit (ERU), which is often defined as the median or representative amount of impervious area found on a single family residential parcel.

The ERU strikes a proper balance between accuracy and fairness of charges in Augusta; as compared to very small or very large units of measure. Very small units, such as billing based on the actual square foot of impervious area, can result in more frequent billing errors because the inexact nature of the computer-based measurements of parcel and impervious feature data. Very large units of measure, such as a unit that represents 10,000 square feet of impervious area, does not sufficiently differentiate between the differences in impervious area (and stormwater impact) associated with different parcels. The ERU allows properties with similar impervious area (such as neighbors in similar homes within a subdivision) to be charged identical charges.

Figure 12 depicts the distribution of impervious area associated with single-family residential structures in Augusta. The representative size (median) is about 2,200 square feet. This was taken as the Equivalent Residential Unit (ERU). The ERU is used as the billing unit (i.e. a monthly fee per ERU). The application of this ERU to develop the fee for different properties is outlined in the following sections.

> ***Augusta shall charge on the basis of an Equivalent Residential Unit of 2,200 (two thousand two hundred) square feet of impervious area.***

6.1.2. Modification Factors

Modification Factors, including rate modifiers or class exemptions, are the second component of the rate structure. Rate modifiers or class exemptions are policies that change the user fee charged to certain classes or types of properties in order to increase simplicity or enhance equity. There are six modification factors considered in this section: simplified residential charges, non-residential charges, fixed cost per account, variable charges based on property class, variable service area charges, and stormwater credits.

Simplified Residential Charges

An important variable in the rate structure is the basis for residential charges and for the equivalent or representative residential unit billing amount. Residential properties, termed single-family residential (SFR) properties, include:

- Residential properties with single-family ownership of lot; and
- All non-commercial residential lots including single-family detached homes, townhomes, duplexes, and triplexes.

The three options for SFR properties, which seem to span the range of common possibility are:

1. **A single flat rate charge for residences:** Charging a single flat rate for all SFR properties can be seen as inequitable if there is a large difference in the amount of impervious area between the smallest and largest homes in a community. Some communities with single flat rate residential charge increase the equity by treating very large residential properties (for instance, those with greater than 10,000 square feet of impervious area) similar to commercial properties.
2. **A tiered structure:** A tiered billing system uses a predictive equation to place each SFR property into one of two or more tiers. A lower fee is charged to groups of SFR properties with a low amount of impervious surface area and an increased fee to groups of homes with higher amounts of impervious surface area. In this system, homes of a similar size receive similar charges related to their demand on the stormwater system. Typically, two or three tiers are established to account for differences in impervious area on single-family residential within a community. This option might enhance the equity compared to a flat rate, since smaller homes would pay a lower rate. A tiered structure increases the cost and complexity of establishing the rate structure.

3. **Individually-determined charges:** Charges based on the estimated impervious area can increase the perceived equity, however are associated with greatly increased costs and increased possibilities for error on a per account basis.

It is desirable to simplify the residential billing as both a cost saving measure and a way to clarify the explanation of the fee.

As a class in Augusta residential properties have less average impervious percentages, have smaller impervious areas, and generally discharge to grassy areas. The average imperviousness for a SFR property in Augusta-Richmond County is approximately 16.7% while the average imperviousness for non-residential properties is approximately 34%. A tiered SFR rate structure can be formulated to recognize that, as a class, SFR parcels are less impactful than non-residential properties. This can be done in lieu of detailed, but hard to manage, residential crediting mechanisms.

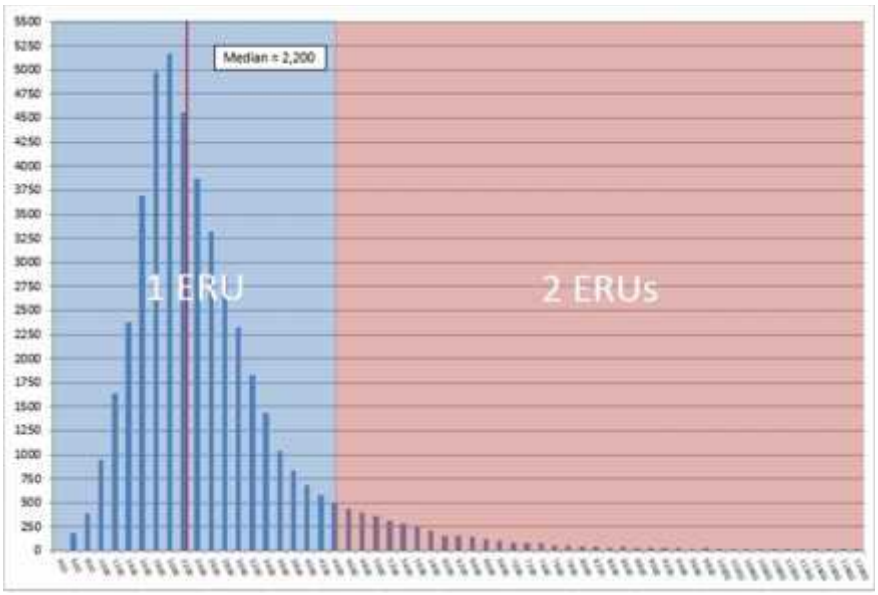

Figure 12. Single-Family Residential Properties in Tiers

Based on discussions with staff AED staff and an assessment of the SFR properties, a two tiered rate structure was chosen. The two tiered system, shown in Figure 12, classifies SFR properties based on impervious area into: less than or equal to 4,400 square feet and greater than 4,400 square feet. Additionally, parcels with less than 400 square feet of impervious area will be treated as unimproved properties and not receive a bill.

The percentage of SFR properties that are included in each tier are:

Tier	Percent	Charge
1	92%	1 ERU
2	8%	2 ERUs

Augusta shall use a simplified residential charge consisting of two tiers of residential properties:

Tier	***ERUs***	***Impervious Area***
1	***1***	***400 - 4,400 ft²***
2	***2***	***>4,400 ft²***

Non-Residential Charges

Non-residential properties (NSFR) include all properties that are not residential and all commercial-residential properties (apartments). AED staff and the consultant team agreed that NSFR properties will pay on the basis of number of ERUs on a parcel rounded to the nearest whole ERU. Thus, for example, a property with 9,300 square feet of estimated impervious area would pay a fee based on 9300/2200 = 4.2 ERUs, which is rounded to 4.0 ERUs.

> ***Augusta shall charge non-residential property on the basis of the total number of ERUs of impervious area rounded to the nearest whole ERU.***

Fixed Cost per Account

A fixed cost per account is a flat base rate that is charged for each account regardless of the size of the lot or the amount of impervious area on the lot. The fixed cost can pay for specific stormwater management program expenses that may not be directly related to the amount of runoff generated by individual properties or the level of service that is provided to them. The fixed cost per account is similar to base fee or minimum bill charged by a water or wastewater utility. These expenses tend to fall into one of three main categories:

- Administrative expenses such as administrative overhead, general financial management, and indirect costs allocated to the utility from Augusta.
- Billing related costs such as postage, customer service costs, and database maintenance.
- Non-directly-attributable general stormwater program costs such as master planning, system inventory, some parts of permit compliance that are unrelated to parcel characteristics, and water quality or other stormwater education.

Most stormwater utilities simply allocate stormwater program costs across the rate base. Some utilities identify and quantify these expenses and bill some portion of them as a fixed cost per account. Some of these costs are difficult to allocate specifically to individual properties or classes of properties, and may be allocated on a per-person surrogate basis (e.g., education, general planning, or customer service) or on a per-account basis (e.g., postage, database upkeep). For example, it costs the same to send a bill to a residence as to a shopping center. Charging a fixed cost per account is not an additional charge but simply a different way of allocating the total program cost. The revenue raised is the same, but the allocation is slightly different between residential and non-residential properties. Due to the small nature of these expenses in Augusta, AED and the consultant team determined that it was not a wise use of resources to calculate the fixed costs at this time.

> ***Augusta shall not charge a fixed cost per account for its stormwater fee, but, this policy may be modified in the future, if appropriate.***

Variable Charges Based on Property Class

Some utilities charge certain properties at differing rates to recognize the unique nature of the property. For instance, while the typical airport has a large amount of impervious area, it may

also operate an advanced stormwater treatment or flood control program, helping to reduce the burden on the City's stormwater program.

Examples of the classes of ratepayers may include:

- publicly owned property,
- roads – public or private,
- non-profits,
- income disadvantaged,
- elderly,
- park land, etc.

Based on discussion with AED staff, it was decided that neither public nor private roadways would be charged a fee. Roadways serve as drainage ways as well as transportation corridors and therefore the cost of service for this shared impervious area would be evenly allocated to all rate payers, generally on the same basis as the user fee. It was also recognized that some rural properties incurred cost to construct and maintain a driveway that is well in excess of the length of most driveways and that this was an artifice of their property configuration. After much discussion it was determined that driveways longer than two hundred feet function like a public road and therefore no charge would be calculated for the additional driveway length.

> ***Augusta shall not charge for either public or private roadways including the portion of private property driveways classified as residential in excess of 200 feet in length.***

Some localities provide assistance to low income and elderly residents, which is based on economic hardship (i.e., ability to pay) as determined by the household affordability ratio (HAR). The HAR analysis typically follows the U.S. EPA approach for comparing total annual utility charges (i.e., water, sewer, stormwater) to median annual household income. The HAR is also used in conjunction with other socioeconomic indicators such the "percent below the poverty line" and percent of unemployment.

It is intended that the stormwater fee be billed on the same bill as the water and sewer bill. As such, after discussion, staff felt that the stormwater rate structure should follow the water and sewer structure, which does not provide a discounted fee for elderly and disadvantaged.

> ***Augusta shall place the stormwater bill on the water and sewer bill.***

Variable Service Area Charges

A variable service charge can be applied in areas where the cost of service is sufficiently different based on location, such as:

- inside or outside an area served by combined sewers,
- by watershed,
- based on variable capital construction or permit cost needs,
- based on intensity of development,
- based on location with respect to a regulated floodplain,

- located in an urban blight or special development district,
- based on the character of the construction within an area (e.g., a neighborhood that employs sustainable green designs throughout),
- based on an area's need for special services,
- based on some special characteristic of the property which can be tied to use of the system such as being an urban hotspot, etc., or
- urban services versus rural service districts.

An analysis was made of the various urban and rural land characteristics, the types of stormwater services provided, the revenue potential of the areas, and the probable program costs. Table 11 shows the distribution of revenue and parcel numbers by commission district.

Table 11. Distribution of Stormwater Revenue by Commission District

Distribution by Commisioner District Monthly Fee= $ 6.40

	1	2	3	4	5	6	7	8	TOTALS
ALL	$ 3,280,349	$ 1,940 119	$ 2,108,909	$ 927 283	$ 1,002,198	$ 1,500,874	$ 1,983 300	$ 1,783,290	$15,311 088
	21%	13%	14%	6%	11%	10%	13%	12%	100%
NONRES	$ 2,730,931	$ 1,339 522	$ 1,109,125	$ 269 261	$ 1,057,536	$ 933,803	$ 1,276 570	$ 989,030	$10,010 880
	27%	13%	14%	3%	11%	9%	13%	10%	100%
RES	$ 555,418	$ 606 797	$ 759,782	$ 658 022	$ 594,662	$ 628,070	$ 706 790	$ 794,260	$ 5,303 808
	10%	11%	14%	12%	11%	12%	13%	15%	100%
Tot Parcels	10,885	10,259	10 624	9,578	8,851	8,832	9,592	12 186	80,807
Area (sq mi)	29	8	16	13	11	15	11	150	252

There was not a notable reduction in stormwater service on a unit basis in rural areas as compared to urban areas. While the intensity of drainage infrastructure is greater in urban areas, the cost per unit is thought to be comparable.

Also, the other potential discriminators for rate modifications were discussed briefly, no consistent and compelling basis was discovered nor preference in rate flexibility application expressed.

> ***Augusta shall not recognize a different billing basis nor apply rate adjustments based on location, cost or level of service differentials, land use character, nor any other parameter except impervious surface area.***

Stormwater Credits

Stormwater credits can be granted to increase equity and to provide incentives to property owners for reducing their stormwater impacts. A credit is an ongoing reduction in a property's calculated stormwater fee for:

- On-going activities on the property that reduce the use of the public stormwater system;
- On-going activities on the property that reduce Augusta's cost of service.

The amount of the user fees that stormwater programs make eligible for credits vary considerably. The extent or generosity of the credit could consider which stormwater program costs can actually be reduced by the qualifying activities of users. Common stormwater credits include: detention, retention, or best management practices (BMPs); private maintenance credit

for larger properties; education credit; green design credit; and NPDES permit credit for industries.

Following a discussion of each aspect of a potential crediting program, AED staff determined that private investments to reduce peak flow and improve water quality should be recognized. Because approximately 40% of all impervious area in Augusta-Richmond County is roadways, which are a shared public responsibility and there is an effective limit on the impact reduction structural controls can have, it was decided to cap the total available credit amount at 65% of the stormwater user fee. If higher credits were allowed, then a property would be, in effect, shifting its share of the shared impervious cost to others.

A number of credit types and their associated goals were discussed. Each credit type was matched to program cost reductions or individual property impact reductions. Based on this review, AED staff decided to offer stormwater credits for peak flow reduction and water quality impact reduction. It was further decided that the credits offered should be: 40% for meeting detention requirements, 5% for implementing more stringent design standards for detention, 15% for meeting water quality requirements, and 5% for certain industries holding a state Industrial General Permit (IGP). There was a discussion of providing an additional Green Infrastructure “bonus” as an incentive for water quality features that infiltrate stormwater runoff but this option was delayed pending regulatory movement at the state level and the potential development of a green infrastructure policy in Augusta-Richmond County.

The AED Staff discussed the ongoing challenges with regional residential detention ponds and the potential related crediting mechanism. It was recognized that residential properties have a reduced charge due to the different runoff characteristics associated with SFR properties; therefore an additional credit is not included at this time. Extending credits to SFR properties would require a more detailed analysis of the numbers and types of ponds, the development of a written policy, and other actions to support decision making.

> ***Augusta shall recognize private investment that reduces the impact of an individual non-residential parcel through a credit program. Credits may include up to a 40% credit for peak flow reduction via detention, a 5% credit for implementing more stringent design standards for detention, a 5% credit for certain industries that hold a state industrial stormwater permit, and up to a 15% credit for water quality treatment. The full credit amount would be allowed for meeting current design standards while a prorated credit will be allowed for meeting a previous albeit inferior design standard.***

6.1.3. Secondary Funding Methods

Secondary funding methods can enhance the revenue stream for Augusta-Richmond County and increase equity by shifting costs for specific services or service levels to those requiring the services. There are a large number of secondary funding methods employed by local governments. Eight secondary funding methods were discussed in more detail: plan review, inspection, and other special service fees; special charges; system development charges; in-lieu of construction fees; impact fees on new development; developer extension/ latecomer fees; special (or benefit) assessment districts; and fines and penalties.

After lengthy discussion it was determined that no changes would be made to the current menu of charges and penalties until such time as the enhanced stormwater program was better established and an inventory of the system and detention ponds was completed.

> ***Augusta shall not change its secondary funding methods at this time but retain current approaches and amounts until the user fee has been established and actual program costs are better established.***

7.0 Rate Study and Cash Flow Analysis

The Rate Study (RS) applies the stormwater program's Cost of Service (COS), outlined herein, to the Rate Structure Analysis (RSA) to determine the final rate that is needed to meet the projected program costs during the analysis period – chosen to be five years. In doing so the RS calculates the available rate base across all customer classes. This projected rate base provides the means to calculate the utility rates and fees. The RS also presents a cash-flow analysis for the first five years of the stormwater management program that are funded by the stormwater utility.

7.1. Rate Base

The rate base is the number of ERUs (billing units) summed from each individual user in the service area. The available rate base in the service area is the foundation for the rate study. As outlined in the RSA, the ERU is defined by the median SFR value of 2,200 square feet of impervious area.

Each parcel was assigned to one of 3 categories: SFR-Low Tier, SFR-High Tier, and Non-Single Family Residential (NSFR). Impervious area estimates were determined for each property using available aerial imagery that was updated for the stormwater fee implementation and other existing GIS data. The rate base (number of ERUs) for each property category was calculated based on the rate structure described above. Table 12 shows the estimated number of ERUs, also known as the rate base. NSFR properties are small in number representing only 3.1% of the properties. However, these properties dominate the amount of impervious area and therefore the number of ERU's (59.2%). Since NSFR properties have proportionally more impervious area, they will be eligible for credits against the user fee, as discussed in the previous section.

Table 12. Augusta Stormwater Utility Rate Base

Property Category	Number of Properties	Number of ERUs
Single family residential – low tier	57,804	57,804
Single family residential – high tier	5,331	10,662
Non-single family residential	7,681	130,293
TOTAL	70,816	198,759

7.2. Rate Model and Cash Flow Analysis

A rate model was developed and tailored based on the anticipated cash flow and the rate analysis for Augusta-Richmond County. The model was used to evaluate the cash flow over the five-year rate analysis period based on the rate charged per ERU. The rate model incorporates the program strategy, specific priorities, cost of service, and rate base data summarized in previous sections.

The cash flow analysis module of the rate model is shown in Table 13. This table summarizes the planned expenditures (program cost) and revenues. AED and the consulting team used the rate model to determine the fee needed to meet the identified program and revenue objectives.

Table 13. Augusta Stormwater Utility Cash Flow Analysis

			Program Years				
1	Program Cost		1	2	3	4	5
2	Existing	Item					
3	$2,680,000	Labor	$2,870,000	$3,070,000	$3,340,000	$3,550,000	$3,630,000
4	$1,550,000	Non-Labor	$2,810,000	$2,960,000	$3,310,000	$3,440,000	$3,560,000
5	$1,250,000	Consul/Contct	$3,910,000	$4,710,000	$4,710,000	$4,360,000	$4,260,000
6	$5,000,000	Flood+CIP+EQ	$7,040,000	$5,950,000	$6,970,000	$6,620,000	$7,570,000
7		Billing + IDC xtra	$ 426,000	$ 426,000	$ 426,000	$ 426,000	$ 426,000
8		Additional CIP/Debt			$ 500,000	$ 1,000,000	$ 1,500,000
9	$10,480,000	PROG TOTAL	$17,056,000	$17,116,000	$19,256,000	$19,396,000	$20,946,000
10	Revenue Reductions						
11		Bad Debt	$ 763,235	$ 763,235	$ 763,235	$ 763,235	$ 763,235
12		Credits	$ 305,294	$ 305,294	$ 305,294	$ 305,294	$305,294
13							
14		SUBTOTAL	$1,068,528	$1,068,528	$1,068,528	$1,068,528	$1,068,528
15	Misc. Revenue						
16	$15,000	NPDES	$15,000	$15,000	$15,000	$15,000	$15,000
17	$0	SPLOST Buy out	$0	$0	$0	$0	$0
18	$5,000,000	SPLOST CIP	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000
19	$2,580,000	Other SPLOST	0	0	0	0	0
20	$7,595,000	SUBTOTAL	$5,015,000	$5,015,000	$5,015,000	$5,015,000	$5,015,000
21							
22	$2,885,000	Revenue Reqmt	$13,109,528	$13,169,528	$15,309,528	$15,449,528	$16,999,528
23							
24		ERUs	198759	198759	198759	198759	198759
25		FEE CALC	$6.46				
26		FEE REC	$ 6.40	$ 6.40	$ 6.40	$ 6.40	$ 6.40
27		Fee Revenue	$ 15,264,691	$ 15,264,691	$ 15,264,691	$ 15,264,691	$ 15,264,691
28		Carry forward		$ 2,155,163	$ 4,250,326	$ 4,205,489	$ 4,020,653
29		Contingency Funds	$ 2,155,163	$ 4,250,326	$ 4,205,489	$ 4,020,653	$ 2,285,816
30							
31		% of Operating	15%	30%	27%	27%	14%

The cash-flow analysis compares the projected costs, found in the Cost of Service Analysis, including: operations, capital expenditures, and non-operating expenses with revenues. Lines 1-17 are explained in the Cost of Service Analysis except for:

- Line 7 – billing costs are calculated assuming 71,000 accounts charged $0.50/account/month to cover all costs related to billing, database maintenance, and customer service.
- Line 8 – additional capital costs are projected to cover anticipated growth in the capital replacement program as system condition inventories are completed and projects prioritized.

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- Line 11 – Bad debt is estimated at 5% of total revenue.
- Line 12 – Credits are estimated to be constant over the first five year period, averaging at 2% of total revenue.
- Line 16 – NPDES permit revenue averages $15,000 per year.
- Line 17 - $0 per year is estimated to come from the SPLOST fund for home buyouts during the five year period because recent funds were one-time only.
- Line 18 - $5M per year is estimated to be the stormwater utility's portion of SPLOST funds for capital construction needs. This has been the case for several years and is expected to continue.
- Line 19 – SPLOST funds will be used along with the user fee to expedite needed capital rehabilitation and improvement projects.
- Line 22 – The revenue required from the stormwater user fee.
- Line 24 – The number of ERUs in Augusta is assumed to remain constant – that is little or no population or net construction growth is projected.
- Line 26 – It was recommended that the user fee remain constant for the first rate period of five years. Thus, after trial and error a rate of $6.40 per ERU per month was calculated to meet the revenue requirement.
- Line 27 – The user fee revenue projection.
- Line 28 – The year end fund balance carried forward.
- Line 29 – Current year fund balance.
- Line 31 – The fund balance in the current year as a percent of operating costs. The goal is an average of two months of operations.

7.3. Rate

Based on the rate analysis the monthly rate per ERU is projected to be six dollars and forty cents ($6.40).

- SFR Low-Tier residences with more than 400 square feet and less than 4,400 square feet of impervious area, including condos, mobile homes, and townhomes will each pay $6.40 per month.
- SFR High-Tier residences with more than 4,400 square feet of impervious area will each pay $12.80 per month.
- NSFR properties will each pay $6.40 per month per 2,200 square feet of impervious.

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8.0 Billing Analysis

This Billing Analysis discusses the general process of billing, collections, creation of the master account file, and customer service.

8.1. Billing

A number of billing mechanisms were evaluated. It was determined that the best option for billing the stormwater user fee was to place the fee on the water and sewer bill administered by the Augusta Utility Department (AUD). The anticipated billing and collections process is described herein in limited detail as many policy decisions yet to be made will affect the process.

The stormwater user fee will be added to the existing monthly water bill provided by AUD to its water customers. The water bill for existing customers will have an additional entries noting the stormwater fee and any credits applied. Stormwater customers that are not current water customers will receive a "stormwater only" bill. It is expected that the stormwater only bill will be mailed quarterly.

Some properties will require special consideration for billing purposes. Those properties and the probable solution for their bill include:

A. Owner of property is different from water customer/tenant on property. The bill will go to the current water customer/tenant. If at any time the building has no tenant water account, then the bill will default to the owner of the property.
B. Multiple water accounts exist on one property. The bill will go to the owner of the property who can then split the bill amongst tenants as appropriate.
C. Multiple properties are identified for a single water account. The customer will receive a water bill with the stormwater user fee addition for each property owned that has a water account but will receive a stormwater only bill for each property owned that does not have a water account. If the customer would like to have all bills combined, they may request so to the AUD customer service department.

8.2. Collections

A stormwater user fee charge will be declared delinquent if not paid within sixty (60) days of the date of billing. Unpaid stormwater user fees will be collected using the methods of the billing mechanism chosen or by filing suit to collect on an unpaid account and by using all methods allowed by Georgia law to collect on any judgment obtained thereby.

8.3. The Master Account File

As described previously, a stormwater user fee will be charged to all developed properties within the service area that have more than 400 square feet of impervious area. The service area includes all area within Richmond County excluding Fort Gordon.

The Master Account File (MAF) is the tool used to match fees to customers and it is the file from which bills are generated. To create the Stormwater Master Account File, information is

extracted from the existing water AUD billing system. This system is water account-based, which means the bill for a property is linked to its water meter.

The parcel database for Richmond County is used to match existing water customers to a parcel(s) by using parcel numbers, owners, and property addresses. Through this procedure, two types of customers are identified, existing customers and new "stormwater only" customers. Existing customers consist of all water customers who will have a stormwater fee addition to their current water bill. New "stormwater only" customers will consist of all customers who are not currently AUD water customers, but will receive only a stormwater bill (e.g. parking lots).

After implementation of the stormwater user fee, the MAF will need to be maintained and updated as necessary. Actions that may require a revision to the MAF include, but are not limited to, the following:

- Owner/customer changes
- New customers (water accounts)
- Additional impervious area is added to properties of existing account holders
- New development occurs which adds impervious area
- Sub-division of land
- Credits or adjustments

The AUD Customer Service Department will assist in the maintenance of the MAF. Procedures for maintenance will be developed through coordination between AUD and AED.

8.4. Customer Service

Customer inquiries will be directed to customer service representatives who will work closely with technical staff, as needed, in responding to inquiries. Generally, customer service staff will handle frequently asked questions about the user fee and billing related questions. Customer service staff will redirect technical questions to technical staff for resolution. Technical questions are those that require investigation to resolve and would likely include the determination of rate class and/or the calculation of impervious area. Customer service representatives will receive training and information to aid in responding to customer inquiries.

A detailed appeals procedure will be established if the stormwater user fee is implemented. Non-single family residence property owners that believe the Equivalent Residential Unit (ERU) component of their stormwater user fee or credit is incorrect and single family residence property owners that believe their property is being billed in the wrong tier level can contact customer service staff to verify or request further investigation.

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9.0 Next Steps

The next steps needed in Augusta are of two types: those necessary to establish sustainable funding of the stormwater program, and those necessary to establish a viable and effective stormwater program. These two types are combined in the discussion below because they need to happen at the same time.

9.1 Final Development of Sustainable Funding

Augusta has followed an efficient yet thorough approach to establish sustainable funding that involves a number of steps in five tracks; program, funding, data, public, and management. Figure 13 depicts this approach and the interrelation between tracks and steps.

The **Program Track** is central to all activity and involves:

- understanding the existing stormwater program activities, policies, staffing, and budget;
- understanding and framing the key issues, problems, needs, and opportunities the city now faces or will face in the foreseeable future;
- developing a set of clearly articulated program priorities, objectives, and policies;
- developing a detailed program cost;
- developing a program implementation plan; and
- executing the initial part of the program plan in anticipation of utility billing.

The **Funding Track** handles the legal and financial aspects of the utility development insuring that the rate approach and its execution follow due diligence and can support the stormwater program. The funding track involves:

- developing of rate structure policies and a rate structure analysis in its three components: basic rate methodology, rate modifiers, and secondary funding methods;
- applying the rate base to the program cost; and
- adopting the rate structure through a hearing and approval process.

The **Data Track** has two main purposes: to develop the master account file and to develop a mechanism to deliver a bill to a customer. Inherent to these two purposes are numerous decisions on whom to bill, how to handle special cases, development of billing policies and procedures, and development of customer service protocols.

The **Public Track** deals with the outreach and education necessary for stormwater utility implementation. It involves the following key steps:

- understanding and framing the “compelling case” for change and for the fee and laying out a detailed plan on how to make this case to the various “publics” that exist in the community;
- developing materials in support of public outreach and education;

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- implementing a general public awareness and targeted stakeholder process;
- implementing a final billing day campaign of public education to insure billing day activities go smoothly and that citizens are aware of the bill and generally supportive; and
- insuring long term branding, visibility and support for the stormwater program.

The **Management Track** simply makes sure that all inter-departmental, or inter-governmental (in the case of several entities) understandings about responsibilities and funding are in place.

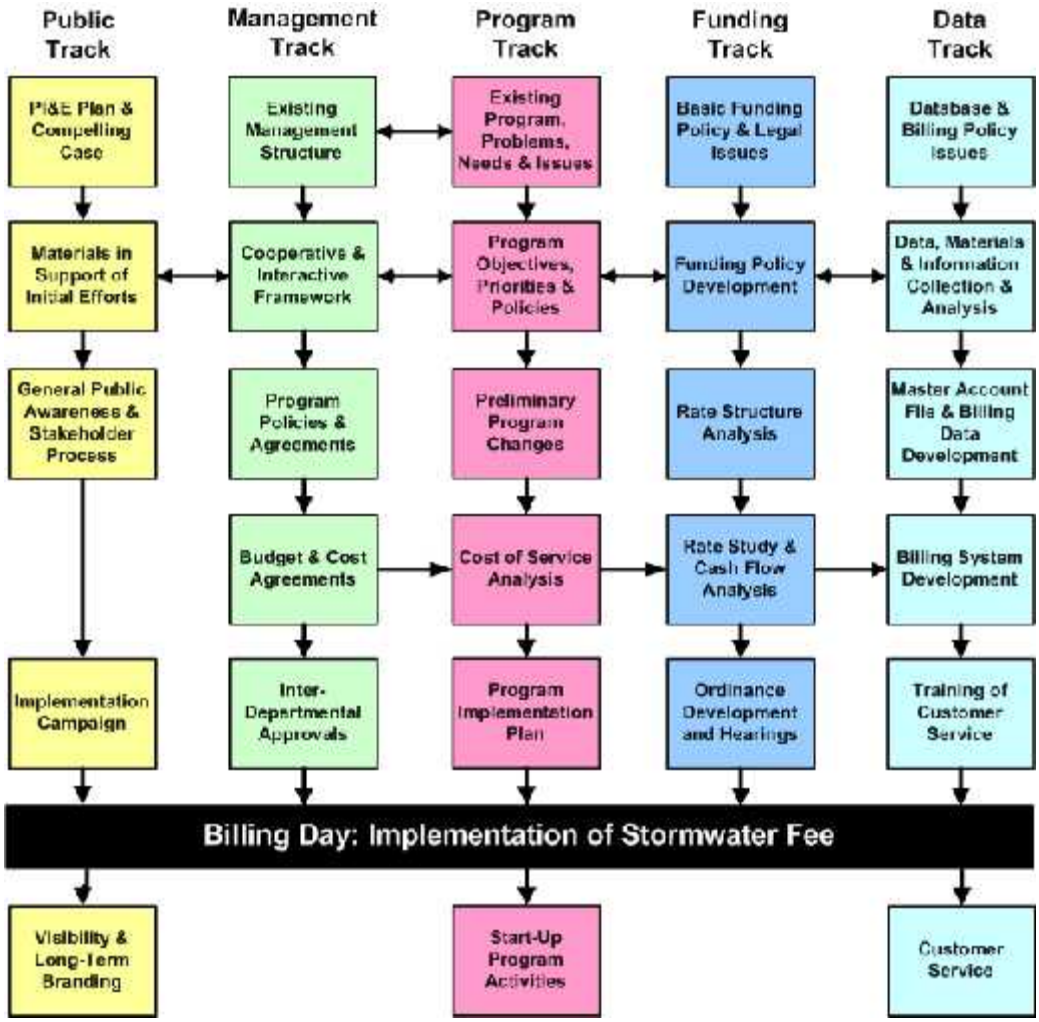

Figure 13. Stormwater Utility Development Process

Augusta has made significant progress in various aspects of the stormwater user fee and planning for implementation; and many of the blocks in this figure have been substantially completed. Recommendations for next steps to support successful user fee implementation are provided in the following sections for the program, funding, data, and public tracks.

9.1.1 Program

A future program concept and a cost of service have been developed and are detailed in Sections 4 and 5. The priorities are focused on three major aspects:

1) manage Augusta's stormwater system and associated assets in a sustainable manner;
2) protect the citizenry and property of the City from flooding; and
3) provide responsive and excellent service to Augusta's leadership and citizens.

To accomplish these priorities, the cost of the stormwater program is expected to grow over five years from the current $10.4M to $19M annually. Several key considerations have been found to be critical in the ultimate success of the program:

Hit the Ground Running

The City is developing a number of smaller stormwater projects ready to go the day the first bill goes out. This allows the city to point to tangible results of the fee on day one. Such projects can include simple and visible projects such as near-street maintenance projects and smaller flood control or infrastructure repair projects.

While one large priority project could gobble up all available funding, it will not provide the visible and equitable disbursement of funds so important to political leaders and citizens alike in the first few months of the user fee's life.

> ***Recommendation: Develop and preposition a set of "first out" projects and maintenance activities and tie them to public awareness and education efforts of that track.***

Use Contract labor to Bridge the Time Delay

The process of adding staff and procuring field equipment can be time consuming. Outsourcing should be used to respond quickly to needs for the first couple of years with prepositioned labor contracts with local contractors. This has the dual benefit of the provision of visible local jobs and the ability to staff up or down with relative ease. Advertisement for contractors should begin well in advance of the initiation of the utility so that projects can be initiated immediately after utility billing is initiated without unnecessary procurement delays.

> ***Recommendation: Pre-position contracts for some of the most immediate jobs (e.g. maintenance) prior to hiring and staffing. In order to hit-the-ground running as discussed above, contracts should be advertised prior to the initiation of the user fee.***

Fix While Planning to Fix

Augusta is in need of a comprehensive and complete system inventory and condition assessment and the establishment of an "asset management" approach to stormwater infrastructure. The scope of the need will overwhelm available budget for the foreseeable

future. On the heels of a system condition assessment must come “masterplans” that are rightly targeted to meet the variety of needs within each neighborhood or watershed. These masterplans might concentrate in some way on the four key needs: asset renewal, flood control, water quality protection and neighborhood restoration and aesthetics.

However, Augusta cannot delay actually fixing problems that would emerge as high priority while going through the planning process to fix problems. The planning process will include analyses of stormwater system adequacy based on data collected in the system inventory in order to supplement the in-house understanding of priority project areas. Therefore, there must be a balanced approach to fix high priority problems now while establishing a strong infrastructure management program over the next three years or so.

> ***Recommendation: Develop a Masterplanning program that will address the four key needs of asset renewal, flood control, water quality protection and neighborhood restoration and aesthetics. Integrate the Masterplanning results into the infrastructure management program to continually enhance the program and migrate from site specific solutions to watershed-based solutions.***

9.1.2 Funding

The rate structure has been established through an appropriate due diligence process and the core key policies developed. These policies include:

- Use of impervious area only as the basis for the charge.
- Use of an ERU basis of charge equal to the median residence of 2,200 square feet of impervious area (IA).
- Assignment of the residential class of users into two tiers in recognition of the significantly lower average impervious concentration and the difficulty in administration of individual residential credits; with 92% of single family residential (SFR) properties assigned to the lower tier (400 through 4,400 square feet of IA).
- Assignment of all non-single family residential classes to a “round nearest” ERU basis where one ERU is 2,200 square feet of IA.
- An adjustment recognizing rural SFR properties are not served with roadways in proximity to their homes as are urban dwellings limiting the driveway contribution to the IA calculation to the first 200 linear feet.
- A crediting system to allow NSFR properties to reduce their charge through private and ongoing investment in flood control and water quality improvement.
- Retaining all secondary funding methods as they currently exist, for now.

New Policies

There will be a need for new policies that might combine the user fee structure and programmatic issues. For example, the City currently maintains about 215 ponds, primarily

residential, that were dedicated to the City in good working order when constructed. Approximately 100 additional residential ponds were probably constructed prior to the dedication program are under the private maintenance responsibility of homeowner associations. AED has expressed a need to develop a policy by which these ponds can be brought into serviceable condition and then dedicated to the City.

> ***Recommendation: Begin to develop a list of recognized policy needs and the priority in which they are developed; those that may have larger cost impacts should be analyzed more thoroughly.***

Procedures for Funding Administration

Procedures for initiation and administration of currently envisioned and potential future policies need to be developed. For example, the approach to credit applications must be developed. There will be a need to inform potential credit applicants of the availability of such credits and, perhaps, to assist in advising on how to develop and submit acceptable applications.

> ***Recommendation: Develop and execute a plan to initiate the credit policies for peak flow reduction and water quality and other policies that are deemed critical to the initial success of the program.***

Ordinance and Other Components

There are several key steps necessary for the establishment of stormwater funding including:

- Development and passage of the rate and program ordinance;
- Development of an enterprise fund to separate and aggregate stormwater user fee funds; and
- Establishment of budgets and fund transfers internally to cover franchise fees, personnel salaries, etc.

> ***Recommendation: Develop the ordinance and resolve any details necessary for the establishment of the enterprise fund and accounting support.***

9.1.3 Data

As of early October 2014, there is significant work remaining in the actual establishment of the billing database and the customer service capability. The decision to use the water and sewer billing database and enQuesta have helped to define tasks including:

- Billing Process and Policy Development
- Meter-Parcel Matching
- Master Stormwater Fee Database Development
- Customer Service Policies and Maintenance Strategy Development

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Customer Service Oversight

In conjunction with, or in addition to, these tasks there is the overall need to provide an oversight and management structure to the billing and customer service functions. There will also be a number of policies needed concerning how to handle various billing situations (e.g. one meter but many parcels or many meters but one owner, etc.).

There are also ways to enhance the customer service experience through automated generation of mapping of parcels with IA coverage shown etc. Some of these have been suggested though no scope modification item has been generated. Once the master account file is complete it will be time to turn our attention to these final preparations and training elements.

> ***Recommendation: Do a "dry run" of the total customer service capability to insure all procedures, policies, and messaging are in place.***

9.1.4 Public

A public education strategic plan was developed at the beginning of the project. The Plan laid out who the "publics" are, how they can be reached, what the messages are, and the phases of the effort. Significant efforts have been expended to educate and gain the support of political leadership and key local business and civic organizations. Support is strong and that is unusually good. Those efforts should continue while adding key more intense efforts to inform the public ahead of the first stormwater bill being mailed.

No additional next steps are recommended other than those in the strategic plan which include:

- Maintenance of communication with the political leadership and key business and civic groups including one-on-one meetings with new commissioners.
- Preparations for a "dummy" bill to be sent out in mid spring with information on the new bill complete with a billing insert for that bill.
- Increase in web presence and social media.
- Development of a campaign to publicize the "first out" projects.
- Preparation of customer service with temporary assistance so that the initial calls are handled well.

Ongoing Public Involvement and Education

AED currently engages the Phinizy Center for Water Sciences to fulfill much of the public education and outreach requirements for the MS4 program. In addition to ongoing public education and outreach activities for the MS4 program, public education and outreach activities need to be developed and implemented to educate the public on the new stormwater utility. Specifically, community outreach methods and materials need to be developed in order to educate the public on stormwater system maintenance activities, capital improvement projects, and general accomplishments resulting from the dedicated funding.

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There will be a need to continue the branding of the stormwater utility and to continue public education. This can take many forms including web presence, social media, new articles, and signage on projects and vehicles.

> ***Recommendation: Develop a public relations strategy that can be initiated upon the first billing of the stormwater user fee to educate the public on accomplishments, or success stories, that result from the user fee.***