Attachment B
Stormwater Utility Manuals

Stormwater Utility Presentation Up-Date

Solutions Taking Shape.

City of Griffin

Stormwater Utility Action Plan

February 25th, 1997

Prepared by:

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OGDEN ENVIRONMENTAL AND ENERGY SERVICES

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

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CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

EXECUTIVE SUMMARY

Introduction

The City of Griffin is exploring the feasibility and advisability of funding its stormwater management program through the use of a user fee system, often called a "stormwater utility". This report assesses the feasibility of such a funding method, lays out program priorities and costs, and other information. Specifically the purposes of this report are to:

- describe the existing stormwater management program in Griffin (Section 2);
- assess the existing problems, needs and key issues related to stormwater management (Section 3);
- develop stormwater program priorities (Section 4);
- look at potential organizational or responsibility changes to better manage stormwater in Griffin (Section 5);
- lay out a basic planned program based on the previous sections (Section 6);
- discuss the feasibility of various funding methods to support the stormwater program (Section 7);
- explore options for the development of the billing master account file and bill delivery mechanism (Section 8); and
- discuss potential ways the new stormwater utility can be introduced to key stakeholders and the public generally.

Current Program

The current stormwater program staffing and budget is summarized as:

Function	Budget	FTE's
Administration + others	$ 50,000	0.65
Operations and maintenance	$400,000	3.50
Capital Improvements	$100,000	
TOTALS	$550,000	4.15

The 4.15 full time equivalents in manpower is divided among 4 administrative/engineering personnel and 10 maintenance personnel. Section 2 gives details.

Current Problems and Issues

The current physical issues facing the City include flooding on the minor drainage system, erosion of ditches and streams, and more minor water quality problems. These are described in Section 3.

These physical issues have been brought about by past development practices and lack of adequate resources to perform maintenance of the drainage system. Flooding occurs because (1) there is more water flowing in the system after urban development than the system was designed to handle, (2) homes were permitted to be located too close to streams, (3) pipes and channel have become clogged with sediment or debris, or (4) poor design has caused problems.

There is a large and growing backlog of drainage and erosion problems which cannot be addressed without more adequate manpower, legal, technical and financial and resources.

Program Priorities

Stormwater program priorities have been developed to guide the program and are described in Section 4. The recommended program priorities focus on developing and implementing a comprehensive, cohesive approach to stormwater management, with emphasis on immediate attention to correcting highly visible drainage problems throughout the City. The significant changes implied by these priorities demand that a "building block" approach be employed. The recommended program priorities listed by each major stormwater functional area are given here:

Management and Administration

A1. Establish a stormwater utility as an administrative and financial focus.
A2. Define stormwater problems and needs in the city more specifically.
A3. Formally adopt a program and financing strategy.
A4. Establish equitable, adequate, and stable stormwater program funding.
A5. Plan and execute organizational and staffing changes.
A6. Conduct public information activities in support of the program.
A7. Enhance management and record keeping systems.
A8. Explore interlocal agreements to optimize local government resources.
A9. Explore and enhance use of appropriate technology including Geographical Information Systems (GIS).

Water Quality

S1. Identify potential NPDES stormwater quality permit requirements.
S2. Define a stormwater quality management strategy.
S3. Identify locally practical Best Management Practices (BMP).
S4. Identify retrofitting opportunities for stormwater quality.

Engineering and Planning

E1. Prepare a detailed stormwater system inventory.
E2. Develop a stormwater master plan for capital investment.
E3. Design capital improvements for high-priority projects.
E4. Develop technical support resources for stormwater operations and regulation.

Operations

O1. Prepare and maintain a system condition survey.
O2. Define the extent, scope, and level of routine maintenance services.
O3. Evaluate privatization of maintenance.
O4. Develop a routine maintenance strategy and identify priorities.
O5. Develop a remedial maintenance strategy and identify priorities.

O6. Establish and conduct expanded routine and remedial maintenance programs.

Regulation and Enforcement

R1. Upgrade City regulations, codes, and requirements.

R2. Develop an inspection program to verify maintenance of key private stormwater systems.

Capital Improvements

C1. Identify and acquire land, easements, and rights-of-entry for capital improvement and operating needs.

C2. Plan and construct capital improvements based on master planning studies.

C3. Plan and construct critical structural BMPs for stormwater quality.

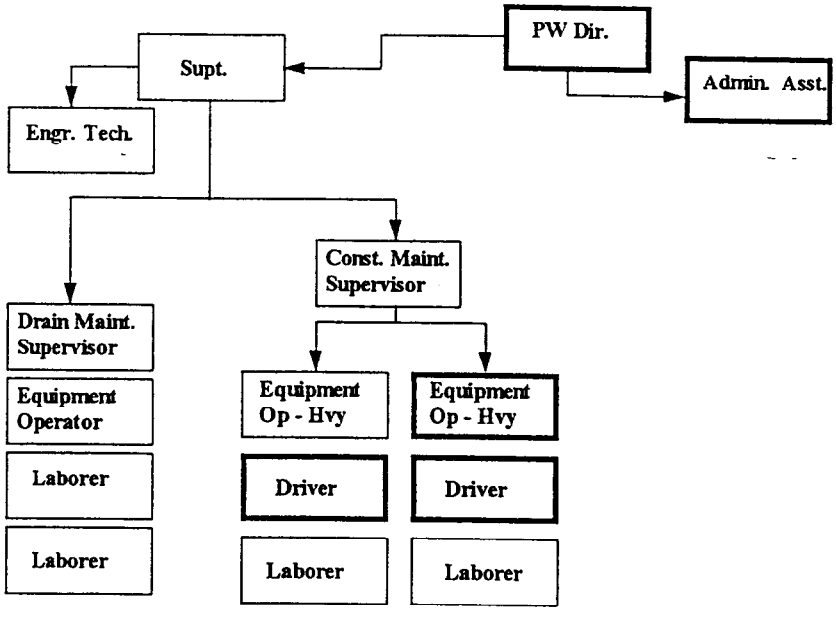
Institutional Options

The consultant team looked into the options for funding legal authority and for potential organization to best accomplish the goals and priorities of the stormwater program. Section 5 gives details.

A basic finding is that the City Commission appears to be free to act under both constitutional Home Rule and the legislatively-granted authority to organize, manage, fund, and account for its stormwater management program in the manner it deems best. This should include establishing a "stormwater utility", adopting stormwater service charges to support both the operating expense and capital investment of the utility, and defining rules and regulations applicable to private properties' use of and impact upon public drainage systems.

Organizationally, the development of a stormwater utility will have three major impacts:

- there will be a demand for a higher level of service in stormwater management than that which now exists;
- there will be a major increase in visibility and accountability; and
- there will be increased demands on the management and support systems that will be the foundation for the stormwater program.



The figure on the previous page depicts a planned organizational structure when all staffing has been completed. The transition to a utility and full realization of the projected stormwater program will take several years. This will allow the changes to occur as evolutionary adjustments rather than an upsetting revolution of the current structure, approach, and systems.

Planned Program

Based on the program priorities the City and consultant have planned for the orderly growth of the stormwater program to meet the program needs. The major thrusts of the program for the next five years (and beyond in some cases) will include:

- an immediate increase in both routine and remedial maintenance capability through the addition of another maintenance crew;
- construction of high priority capital improvements; and
- improvement of technical capabilities.

Section 6 and the table below give details of the program elements.

Preliminary Cost Estimates for Stormwater Program
(1997 dollars)

#	Program Element	1997	1998	1999	2000	2001	2002	On-going
EXISTING PROGRAM								
1	Administration	50	50	50	50	50	50	50
2	Operations & Maintenance	400	400	400	400	400	400	400
3	Capital Improvements	100	100	100	100	100	100	100
PLANNED PROGRAM								
4	Billing and Indirect cost		60	60	60	60	60	60
5	Rate Study			25			25	
6	Add two personnel		90	90	90	90	90	90
7	Add one Crew for O & M - Equipment		180					
8	- Operations (mid-yr.)		85	170	170	170	170	170
9	Add one Crew for O & M - Equipment				180			
10	- Operations (mid-yr.)				85	170	170	170
11	Fly City, Ortho photos, digital mapping	**50**[1]		**100**	100			
12	Establish Basic GIS Capability	**25**	**25**					
13	Inventory System		**50**	**50**	**50**			
14	Develop GIS Applications			50				
15	Stormwater Master Planning ($450,000 total)[2]			50	100	100	100	
16	SPLOST Capital Construction Program	**150**	**200**	**100**	**200**			
17	Extended Capital Construction Program					200	200	200
18	**TOTALS**	775	1240	1245	1635	1340	1365	1240

[1] Note - bold totals are expected to paid from SPLOST funds

[2] Master planning continues for another year only and is not ongoing after that.

Funding Feasibility

Section 7 looks at the feasibility of various funding methods, both for the basic utility fee and for secondary funding methods. In summary it recommends the following:

- The City should establish a stormwater utility as a separate cost center.
- The stormwater utility should be funded primarily from service charges.
- Bonds should be used to pay for only major capital improvements.
- Special service charges should be used to increase equity.

- Service charge credits should be provided for properties which have on-site stormwater management facilities.

Billing and Collections

We anticipate using the current UBS billing system to deliver the bills to the stormwater customers. There have been some issues identified with the use of the system which will need to be clarified. Additionally, we will be developing estimates of the impervious area of all non-single family residential properties through the use of aerial photography developed by the state and a Geographic Information System process. Section 8 details this approach.

Public Involvement and Education

It is vitally important to keep political leaders, stakeholders and the general public abreast of the concept and development of the stormwater utility and specific decisions that are made. The following is an overview of the PIE schedule detailed in Seciton9.

Activity	A	M	J	J	A	S	O	N	D	J	F
1. Develop Brochures/ Fact Sheets											
2. Free Govt. Information											
3. Bill Stuffers											
4. Information Workshops											
5. Identity Creation											
6. CIP Project Booklets											

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 1 OVERVIEW

The purposes of this report are to:

- describe the existing stormwater management program in Griffin (Section 2);
- assess the existing problems, needs and key issues related to stormwater management (Section 3);
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- lay out a basic planned program based on the previous sections (Section 6);
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- explore options for the development of the billing master account file and bill delivery mechanism (Section 8); and
- discuss potential ways the new stormwater utility can be introduced to key stakeholders and the public generally (Section 9).

This section provides an overview of stormwater management as it is practiced in municipal government. The following discussion applies to cities and counties generally and may not apply in every detail to Griffin. However, it helps to give the reader who may not be familiar with urban stormwater an understanding of the various technical and institutional components that work together to make a comprehensive stormwater management program.

An Historical Perspective

A hundred years ago, the primary concern with surface water in Georgia was draining it from wetlands and flood plains to make way for agricultural development. Later, as flooding of developed areas and demands for cheaper power increased, the concern broadened to include flood control and hydropower development. This was the hey-day of the Corps of Engineers' and Bureau of Reclamation's river projects. Suburban growth in the 1950's through 1970's coupled with higher expectations for quality of development led to the installation of efficient curb and gutter drainage systems to quickly convey rainwater off streets and yards and into streams. Protection of roads and property was of paramount importance. Throughout the later part of this period it became apparent that localized flooding was often caused by this type of development and the importance of on-site and regional storm water detention basins became recognized. The Atlanta area became a leading proponent of the use of stormwater detention for all developments. Later, the fact that detention may not be advisable for all developments and the advent of the

micro computer led directly to the ability to actually plan drainage systems for existing and future development. Modern storm water quantity management was born.

Subsequently, the recognition of the importance of urban areas as sources of non-point pollution grew based on information from Section 208 studies, the experience of various cities, and other data gathering efforts such as the National Urban Runoff Program (NURP). This culminated in the early 1990's with the publication of Federal regulations mitigating and controlling pollution runoff in urban storm water. Comprehensive storm water quality management began. Though it is now only mandated for the larger cities and counties in Georgia it will eventually spread to every small town and urbanized areas. Even without these pressures recent court cases, erosion control issues, and recent state actions make consideration of surface water pollution a concern for all cities and counties.

As we look to the future it is clear that looking at "holistic watershed management" will be the key, and not just at the urban system or even the riparian corridor. Aquatic ecology and biology will become ever more important as will the involvement of each stakeholder group within a given watershed.

Each of these changes in the way we look at surface water (stormwater being part of this) runoff was a by-product of urban growth. Each engineering response to growth pressures, in turn, created other unforeseen problems. Drainage of marginal lands for agriculture removed the natural buffering action of flood plains and wetlands, thus increasing flooding and non-point pollution. Large river projects modified, sometimes adversely, stream regimes and environments. Efficient drainage of urban areas often led to nuisance flooding, the gutting of small urban streams and the destruction of in-stream ecosystems. Multiple privately owned detention basins have often proven unmanageable and unmaintainable while becoming ineffective eyesores, often after only three to five years. Pollution control programs and structural controls may suffer a similar fate if appropriate institutional support mechanisms (legal, financial, organizational and technical) are not in place.

Understanding Storm Water Management Problems and Solutions

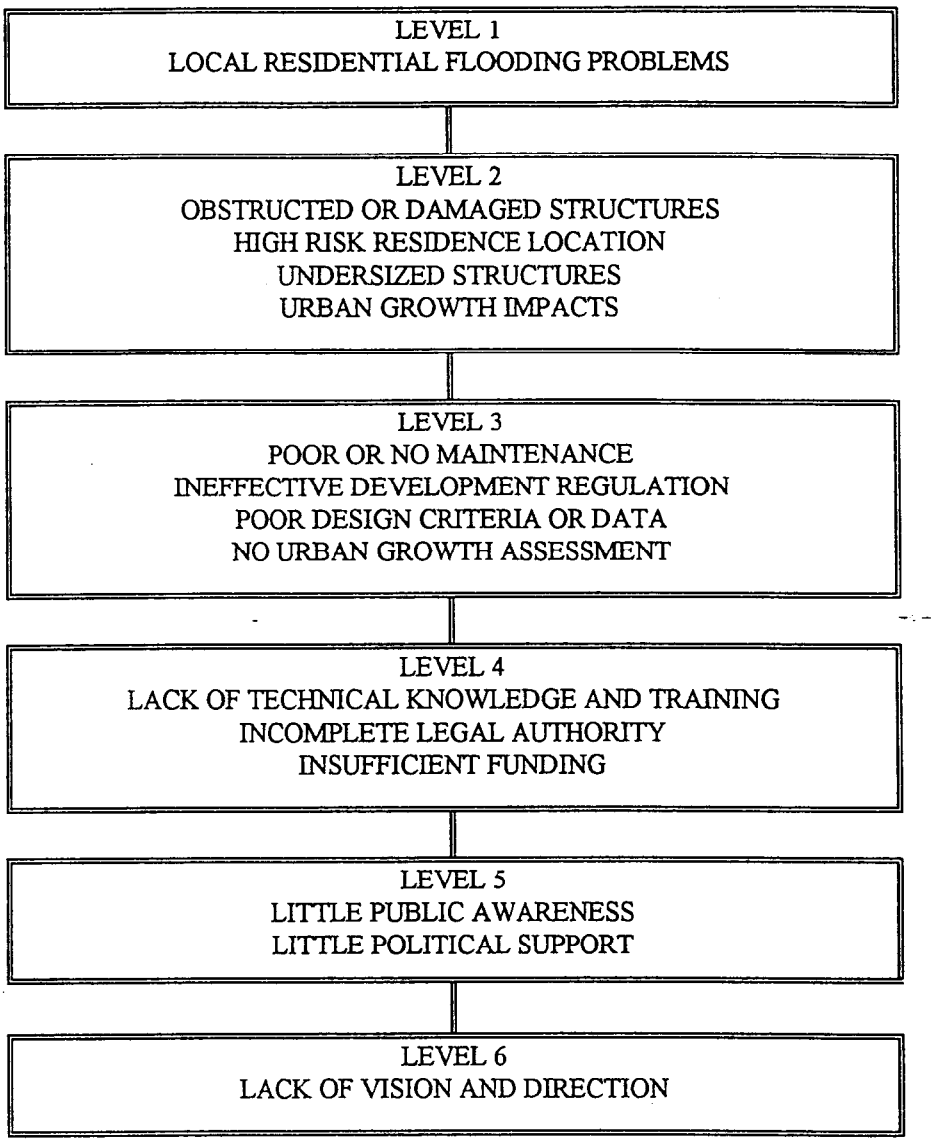
It is vitally important to understand the linkage between physical problems and deeper institutional root causes of these problems. Many municipalities have not understood this linkage and, as a result, wrestle continuously with the same physical problems never arriving at permanent solutions. The figure on the next page illustrates the dynamics of this technical-institutional relationship using a "five whys" methodology which comes out of a Total Quality Management (TQM) consideration of storm water management.

Typically, a city engineer, public works director, or political leader gets a drainage complaint call: "I have a flooding problem and I want you to fix it." This is Level 1: the complaint. The complaint could just as easily have been an erosion or pollution complaint.

When the question is asked: "Why is there a flooding problem?" (Level 2), there is usually one of (or a combination of) four reasons: (1) obstructed or damaged structures; (2) high risk residence

location; (3) undersized structures; or (4) increased flow due to the impacts of urban development. A fifth reason is that the storm in question was larger than the system was designed to carry, even if the other four reasons do not come into play.. The typical solution is to go out and fix the problem or, more commonly, tell the resident that the problem is not the city's responsibility or there is no budget to handle such problems.

However, if the Level 3 question is asked: "Why did this flooding problem (and ones like it) occur in the first place?" a matching set of four, more foundational, reasons is uncovered:



Multi-level Storm Water Problems

1. Structures are obstructed or damaged because they are not inspected and maintained. Municipalities typically maintain very little of the drainage system. Most maintenance that is done is in response to complaints and performed within the street right-of-way only.

1. Cities do not require appropriate levels of technical analysis because they are not sure what to require and how to implement these requirements. In spite of the wealth of computer software for drainage system analysis and the ability to remotely collect rainfall and runoff information, most municipalities have not had the time or the knowledge to investigate and invest in such solutions. Programs are often staffed on a day-to-day basis by junior or mid-level engineers without the authority or experience to implement such programs. Their superiors have multiple other responsibilities and, without prompting and education, do not see storm water as having the same importance or the same clear solutions as improved roads or solid waste disposal.

2. Cities do not impose certain flood mitigation measures, development controls or maintain off the public right-of-way because there is no legal authority to do so. In addition, there is little motivation to establish such authority. To extend control of development beyond Federal mandates or to extend maintenance beyond the bare minimums requires gaining the support of political leaders, key staff members, and "stakeholders". It is often difficult to stimulate such desires when so few of these individuals have anything clear to gain by doing so. EPA mandates, local citizen groups and/or a big flood event are often the necessary catalysts to provide this motivation.

3. Even if these last two factors were solved the bottom line is that there is no stable, adequate, and equitable funding source for storm water management. Storm water usually cannot compete effectively with such things as solid waste or street repair for general tax based funds. Therefore a shift toward dedicated storm water funding is occurring throughout the country. This can take the form of such things as sales taxes, earmarked tax revenues and user fee systems (storm water utilities).

The more basic factors emerge with the next "why" question (Level 5). Even when key storm water staff understand the problems they must ask: "Who else is aware that flooding, erosion, or pollution problems exist? Who supports a growth in storm water management? Who must support it for a successful program to be established?"

The public is usually somewhat aware of flooding problems and municipal staff have little long-term political support to solve such problems. If actions are not taken and decisions made within a month or two after a flood event support quickly dries up. Memories fade and other pressing demands thrust aside flooding, erosion, and surface water pollution problems. The problem still remains, largely invisible, until the next time a large storm moves through the area. Building and maintaining consensus and support for the storm water program is necessary for its establishment and survival.

The basic reason for lack of success in storm water management is the same as for lack of success in anything else; lack of vision or direction (Level 6). In almost every case where a successful program has been developed, one or several individuals had or developed a vision for what their streams and creeks should and could be. A southwestern city wanted its citizens to be safe from major floods and developed a vision for attaining that goal. A Northwestern suburb wanted its streams to remain pristine spawning grounds for salmon and places for recreation. A Midwestern

city wanted its miles of underground pipes to function as they were designed and to remove the thousands of traffic barricades, due to flooding, throughout the city. An eastern city wanted its streams to become urban greenway trails, attractive to its citizens. In each case a dedicated few charted the course and set the pace for the many. They built consensus, informed the public, developed effective technology, established policies and procedures and implemented well thought-out plans.

The same six levels of linkage can be applied to other aspects of storm water management. For example, had the original complaint been an erosion or sedimentation or pollution problem an analogous set of factors causing erosion and sedimentation can be given.

Institutional and Technical Aspects

Technical solutions will never work to fix institutional problems. Unless the institutional roots problems are addressed the physical consequences (flooding, erosion, crumbling drainage infrastructure, pollution) will never be fixed.

Notice that the first levels of assessment contain primarily physical and technical problems for which structural technical solutions are appropriate. Water is impacted by some physical means. However when the later levels are considered the problems, then the solutions are institutional, programmatic and non-structural in nature. People are impacted by administrative means. These foundational problems allow or generate the more visible physical problems. If the root institutional problems are not eventually solved there will be a continual need to respond to an overwhelming number of flooding, erosion, and pollution complaints. And the basic philosophy will continue to be that damage must be suffered before corrective action can be taken rather than taking preemptive action to avoid problems. Successful municipal storm water management programs account for and deal with both the technical and institutional aspects.

Stormwater management programs which have been developed to solve these problems are usually developed and implemented by technically based persons. However, to implement a successful and effective storm water management program in today's political climate, the technical side must be complimented by the institutional side.

The storm water management structure must bring together the institutional goals and objectives and the technical solutions by means of regulations, policies and ordinances. When properly conceived this legal authority spans the gap between the two by pairing institutional goals or concerns with technical solutions through the use of performance oriented criteria.

Framework for Solutions

Solving storm water problems is a "building-block" process requiring patience and skill. It took a long time to develop problems and it will take some time to solve them.

The overall plan to solve this stormwater management dilemma is to do two things at once. Day-to-day the program must beheld together until long term help can be put in place. The long term

plan has the goal of taking what is there and slowly, in a building-block fashion, converting it to a stable and thriving program meeting the demands of the citizens.

The starting point is normally the development of an action plan which looks squarely at the problems and, in a method similar to the figure above, seeks to build solutions through changing both public and political perceptions and technical approaches. It operates at each of the levels identified. It stresses that public and political "ownership" of the drainage system and solutions to fix it are just as important as having the correct technical approach, right legal authority and strong financing. This document is such an action plan for Griffin.

The action plan is the beginning of a process, not an end-all report sitting on a shelf. There have been many success stories around the country. These can serve as models for Griffin. Through patience and skill the process can lead to a safe, clean and enjoyable surface water environment for everyone.

In the next section we will discuss the existing stormwater program in Griffin.

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 2 EXISTING PROGRAM

Stormwater Functions

This section describes the existing stormwater program in Griffin. Before we describe the Griffin program it will be good to look briefly at the various components that typically go into an effective stormwater program.

The table on the next page lists, in terms of cost centers, all the major components of a comprehensive stormwater quantity and quality program. Few cities and counties need or have all these functions. Even those that do rarely have all of them well developed. This is a checklist against which we can compare Griffin's current efforts and identify components that are missing. Some program elements may not need to be done in Griffin, even if they are done elsewhere.

The Griffin Program

Administration

Administration of the stormwater program is handled through the Director (25% time) and Assistant Director (10% time) of Public Works. They are assisted by the Streets Superintendent (15-20% time) and administrative support (10% time). The total estimated annual budget for stormwater administration is $50,000.

Special Programs

There is one program which fits under this heading: the urban forestry experiment. The city has received a grant to study the impact urban forests have on flooding timing and magnitude.

In an activity somewhat related to stormwater control the city sweeps streets of leaves for 2 1/2 months in the fall, primarily to prevent clogging of inlets.

Billing and Finance

There is an effective billing system which is includes several line items. It is anticipated that a stormwater utility bill could be added to this bill. The cost of $60,000 per year for this, and all other indirect allocations, can only be estimated at this time. This estimate was supplied by the staff after extended discussions.

MAJOR STORM WATER MANAGEMENT FUNCTIONAL COST CENTERS	
1. **Administration** General Administration Gen Prog Planning and Development 2. **Special Programs** Public Awareness and Involvement GIS and Database Management Spec Prog Planning and Dev 3. **Billing and Finance** Billing Operations Customer Service Financial Management Capital Outlay 4. **Indirect Cost Allocation** Overhead Costs Cost Control Support Services 5. **Storm Water Quality Mgmt** Quality Master Planning Retrofitting Program Comprehensive Monitoring Program Struc and Non-Struc BMP Progs Pest, Herb and Fertilizer Used Oil & Toxic Materials Street Maint Prog Spill Response and Clean Up Prog for Pub Ed and Reporting Leakage and Cross Connections Industrial Program Gen Com and Residential Program Illicit Con and Illegal Dumping	6. **Engineering & Planning** Des Criteria, Stds and Guidance Field Data Collection Quantity Master Planning Design, Field and Ops Engineering Hazard Mitigation Zoning support Multi-objective Planning Support 7. **Operations** General Maintenance Management General Routine Maintenance General Remedial Maintenance Emergency Response Maintenance Infrastructure Management Public Assistance 8. **Regulation and Enforcement** Gen Code Dev and Enforcement General Permit Administration Gen Drainage Sys Insp & Reg Flood Insurance Program Multi-Obj Floodplain Management Erosion Control Program 9. **Capital Improvements** Major Capital Improvements Minor Capital Improvements Land, Easement, and Right-of-Way

Overhead Allocations

Overhead is not allocated to special departments at this time but taken from the general fund. See discussion under billing above.

Water Quality

There are several known stormwater quality problems having to do with trash accumulation, bank erosion, and industrial pollution (Dundee Mills).

There is no separate budget to handle stormwater quality and no special program in this area.

Engineering and Planning

The function of engineering and planning is to provide technical support to a stormwater program. This includes watershed and drainage corridor master planning, development of ordinances, remedial maintenance project plans, design criteria, zoning support, design support, floodplain administration technical support, and other related activities.

There are three rain gages available to collect rainfall information in the city and several flow gages. The current standard is for the pipe systems in the city to be designed for the 25-year flow occurrence, with detention on new private developments to be designed for the 100-year flow. All new developments are required to put in detention.

The budget for this function is included under Administration.

Operations and Maintenance

The operations and maintenance program is responsible for keeping the stormwater system functional. City maintenance crews clean catch basins and inlets, clear and open ditches, clear debris, and repair stormwater infrastructure (culverts, pipes, etc.). We distinguish two types of maintenance: routine and remedial. Routine maintenance involves cleaning and clearing the existing system but no repairs. Remedial maintenance repairs the existing system restoring it to its constructed condition. By way of comparison, capital improvements replace the existing system with a larger or better system.

The current maintenance program in Griffin spends about 75% of its effort responding to citizen complaints and 25% of its effort in performing routine maintenance chores not triggered by complaints. The City receives about 800 to 1000 complaints per year. The complaints are funneled to the City Engineers office where they are logged in and given to one of the engineering staff for investigation.

After investigation the complaint is handled in one of four ways. 60% of the complaints are in category one:

1. The complaint is fixed within 24 hours if it is fairly minor.
2. The complaint is put into a queue and fixed at a later date if it requires minor materials or the planned and concerted labor of a crew.
3. If the complaint requires a remedial or minor capital project it is placed in a different que and funded from a pot of money available from the general fund. The planning and design is either handled in-house or through consultant assistance. Approximately $100,000 is available annually to handle this type of problem.

4. The complaint requires a major capital improvement to be planned and designed larger than is prudent from the $100,000 pot it is placed in a different category and special funding is requested through the city council.. If that funding is granted it can be corrected.

A large number of complaints are handled through this system. And a large number of the more serious complaints are not able to be dealt with due to funding limitations or the fact that the problem is on private property. Often the City does not have a drainage easement to go and perform maintenance on private property but obtains permission prior to actions. If construction is involved a construction easement is normally obtained.

Five years' worth of maintenance actions are maintained in engineer field books.

There is no current inventory of the drainage infrastructure, current mapping nor as-built drawings available in an organized fashion.

Maintenance staff consists of a 5-man crew (plus superintendent) dedicated 50% to drainage work. They consist of 2 drivers, a heavy equipment operator and two part-time labors. There is an additional 5-man labor crew which works about 10 to 15% in stormwater cleaning of catch basins and ditches.

The annual operations and maintenance budget is not static, as it can be adjusted somewhat from other funds to meet emergencies. But on average the annual operations and maintenance budget is estimated to be:

5-man crew - labor	$ 70,000
5-man crew - other	$ 90,000
5-man labor crew	$ 50,000
drainage repairs fund	$100,000
drainage repairs materials	$ 40,000
potential contingency fund	$ 50,000
TOTAL	$400,000

Regulation and Enforcement

The city does not have a specifically designed regulatory program apart from the inspections of the administrative staff. There is a semi-annual inspection of 29 detention ponds located in the city.

Capital Improvements

There is a large and growing backlog of known capital needs. The current backlog is about $8 million. However, this total consists only of those complaints that have been investigated and studied sufficiently to develop a plan and cost estimate. The amount

actually spent on capital improvements in the city is small compared to the need - perhaps $100,000 annually.

The actual capital need is estimated to be much higher than this figure - probably in the range of $40 to $50 million. These major capital projects range from about $75,000 to over $1 million dollars to construct. They are funded from special appropriations from the general fund approved by council. Master planning studies can better establish the actual capital need.

Summary of Costs and Manpower

The total budget for stormwater for Griffin is summarized as:

Function	Budget	FTE's
Administration + others	$ 50,000	0.65
Operations and maintenance	$400,000	3.50
Capital Improvements	$100,000	
TOTALS	$550,000	4.15

The 4.15 full time equivalents in manpower is divided among 4 administrative/engineering personnel and 10 maintenance personnel.

In the next section we will discuss the problems, needs and issues facing Griffin regarding its stormwater program and physical stormwater drainage system.

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 3 PROBLEMS, NEEDS AND ISSUES

Overview of Problems

In this section we will discuss briefly the problems, needs and issues facing Griffin regarding its stormwater program and physical drainage system.

Recall that in Section 1 we discussed how foundational institutional issues and problems will lead to the physical flooding, erosion and pollution problems we see within the city. In this section we will identify physical problems in the city and uncover the levels of more institutional causative factors which allowed these problems to grow in the past, or may allow them to continue into the future.

Problem and Issue Details

The tables in this section seek to summarize the physical problems and the first two levels of cause. they were derived through a series of discussions between the Ogden Team and Griffin staff.

Flooding

Physical Problem	Immediate Causes	Secondary Causes
Flooding in Minor System	No system planned or existing	Little review or no criteria in the past
	System undersized	Poor or no design criteria in the past
	System failed or blocked	Inlet frame design clogs easily
		No maintenance of parts of the system
		Poor design or construction
		Aged system and poor material - metal pipes corrode
		Acidic water corrodes pipes
	More water into system	No thought to downstream flooding
		Poor design criteria
		No master plans or models
	Poor home and structure location	No knowledge of floodplains outside FEMA locations
		No mapping

The most visible and important physical problem in Griffin is minor system flooding. Much of the cause of this problem is past practices in the planning (or lack thereof) and design of these older systems. In some cases the street has few catch basins and inlets, they then empty into side yards not prepared to accept such flows, or the water flows downhill along paths never intended to carry runoff. The result has been standing water, eroded yards, and nuisance flooding.

In other cases the system has been unattended since its construction many years ago. In that time period the system has deteriorated to the point that it cannot carry even minor storm rainfall runoff. This deterioration includes both failure of the system through crushing, corrosion, and simply falling apart to clogging with sediment and debris.

Urban development has significant impacts on the adjacent downstream drainage system. Higher peak flows, higher velocities, and more flow volume all have their impacts. The result from this urban development on even a well designed and maintained system is flooding and erosion. This is true because the forces and stresses placed on the system are more than it was designed to handle. In other cases there was simply no consideration of what would happen to the flows once they left the upstream developing property.

And finally, homes and structures are located in areas which place them in the path of flood waters. This is true because there was either no consideration or insufficient data and legal requirement to tell builders where the flood waters would be. The Federal FEMA enforced floodplain regulations have effectively kept many newer homes out of the floodplains of the major streams. But similar local regulations have not existed protecting both residents and builders from constructing along more minor feeder streams and ditches well within the 100-year floodplain. the result is little flooding along major streams but significant flood damage and danger along the more minor streams.

Many of these problems have been avoided in newer developments and will be handled even better in future developments. There is now better design criteria, better planning, a detention requirement and more knowledgeable builders. However, the City has inherited from the past a large number of problems which must be addressed at some point. Additionally, the City is considering an aggressive annexation program. This annexation will impose burdens on the City to both solve newly annexed areas' storm drainage problems and master plan to avoid inadvertently building new problems.

The ability to avoid new problems and solve old ones depends on a combination of foundational needs being addressed including: better development regulations, better design criteria, more effective enforcement, tools for analysis, mapping, an accelerated capital improvements program, and, finally, funding to support these efforts. In order to do these things the political leadership, key stakeholders and the general public must be behind the efforts. This calls for a public awareness and education campaign and ongoing program.

Erosion

Another physical problem is the erosion of major ditches and streams in Griffin. The major cause of erosion in major streams is more water and susceptible banks and beds. Streams in their natural setting tend to be in a constant state of what is often terms "dynamic equilibrium". By that we mean that they are unstable but in minor ways that tend to vacillate around a generally stable bed and bank configuration. The sediment moving into the stream system from minor erosion of the landscape is moved through the system exchanging itself with the sediment in the bed and banks. There may be periodic minor buildup of sand bars or some minor bank caving but, overall, there is stability. There is a balance among the range of storm flows, the sediment and vegetative resistance to movement and flow and the sediment supply from upland areas.

In such a stable situation the habitat creates the possibility of a healthy ecosystem consisting of the whole range of macro invertebrates, insects, fish and mammals. These rely on the vegetation in the stream and bank areas as well as the riparian vegetation along the stream corridors.

Physical Problem	Immediate Causes	Secondary Causes
Erosion of major ditches and streams	More water from new development	No volume or detention controls
	Little bank protection	No policies to protect bank
	Few erosion controls on new development	Little inspection or enforcement
		Little criteria
	Soil easily erodible	
	No maintenance and repair	Funds, permits and manpower

When urban development occurs the balance is drastically upset. Impervious areas (pavement, rooftops, sidewalks, etc.) may increase the peak flows five fold, velocities several times and flow volumes a similar amount. This glut of water can scour banks clean of vegetation and life forms, it can undermine near-bank trees and shrubs causing them to fall into the stream and clog it with debris. Because it exerts a stronger and longer force on the bends and bed it causes bank caving, scour of the banks, and channel widening and deepening. If the change is excessive it can even encroach on man-made structures undermining building and bridge foundations and roads.

The impacts of this development can be mitigated through the use of flow slowing detention ponds, development limitations, buffer strips, and the like. Early notification of impending erosion problems through an effective inspection program can trigger effective maintenance of the banks to avoid the worst problems. Controlled erosion may be allowed to carry greater flows and then banks stabilized and replanted encouraging a healthy ecosystem through a healthy and varied habitat.

Again the foundational issues deal with funding, policies, legal authority, manpower and funding... and public support.

Water Quality

Water quality problems are often more subtle than the other physical problems identified above. There are rarely catastrophic spills of colorful or odoriferous substances which capture the public's attention. Only rarely does a river catch on fire or a pile of dead fish wash up on shore due to some oxygen deficit.

Normally water quality problems grow by unseen degrees, little by little. Each new quart of spent oil dumped down a catch basin, each new cloud of sediment released from a newly graded site, each new shade tree removed from a streambank contributes to a gradual degradation, a slow strangulation of life forms, a creeping depletion of oxygen, a scouring of necessary habitat. Trash builds up in urban stream because people see the streams not as an amenity to enjoy and protect, but as a convenient abandoned dumping grounds. Industrial discharges discolor the waters because permit requirements allow it and technology or investment in control technology is not sufficient to keep chemicals from the streams.

Physical Problem	Immediate Causes	Secondary Causes
Water quality problems	Sediment in the flow	Few erosion controls
		Little inspection
	Trash in the streams	Ordinance lacking
		Public awareness lacking
	Dye in the stream	NPDES permit not strict enough

The next section will discuss the stormwater program priorities which grow out of this brief consideration of problems, needs and issues.

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 4 PROGRAM MISSION AND PRIORITIES

This section outlines the major priorities or directions which should guide the Griffin stormwater program for the next three to five years. It is based on discussions with City staff and a consideration of the findings of the last three sections. The priorities are outlined for each of the major functional areas, combining the first four into one general area. The Table below is from section 1.

MAJOR STORM WATER MANAGEMENT FUNCTIONAL COST CENTERS	
1. **Administration** General Administration Gen Prog Planning and Development	6. **Engineering & Planning** Des Criteria, Stds and Guidance Field Data Collection Quantity Master Planning Design, Field and Ops Engineering Hazard Mitigation Zoning support Multi-objective Planning Support
2. **Special Programs** Public Awareness and Involvement GIS and Database Management Spec Prog Planning and Dev	7. **Operations** General Maintenance Management General Routine Maintenance General Remedial Maintenance Emergency Response Maintenance Infrastructure Management Public Assistance
3. **Billing and Finance** Billing Operations Customer Service Financial Management Capital Outlay	8. **Regulation and Enforcement** Gen Code Dev and Enforcement General Permit Administration Gen Drainage Sys Insp & Reg Flood Insurance Program Multi-Obj Floodplain Management Erosion Control Program
4. **Indirect Cost Allocation** Overhead Costs Cost Control Support Services	9. **Capital Improvements** Major Capital Improvements Minor Capital Improvements Land, Easement, and Right-of-Way
5. **Storm Water Quality Mgmt** Quality Master Planning Retrofitting Program Comprehensive Monitoring Program Struc and Non-Struc BMP Progs Pest, Herb and Fertilizer Used Oil & Toxic Materials Street Maint Prog Spill Response and Clean Up Prog for Pub Ed and Reporting Leakage and Cross Connections Industrial Program Gen Com and Residential Program Illicit Con and Illegal Dumping	

Defining the mission and priorities is a critical step in making funding decisions. Some types of funding are well-suited to nearly all types of program expense. Other methods are applicable only to a specific activity or type of cost. Routine maintenance, repair of deteriorated systems, regulatory activities, and capital improvements might all be funded from different sources, so the specific priorities need to be understood to guide the timing of implementing various funding methods. Once the program mission and priorities are clearly in mind, it is easier to select the preferred funding method or methods and implement them in a manner consistent with the stated objectives.

The development of the specific stormwater program also grows directly from the establishment of a clearly articulated program mission statement and program priorities.

Program Mission Statement

It is important to establish the basic goals and mission of a stormwater program. The mission statement is a broadly based guidance policy defining the long-term purpose of the stormwater program. It provides a foundation for other policies on the extent, scope, and level of service, funding, and other issues. The mission statement is a succinct expression of the primary long-range goals for the stormwater program.

A municipality must seek to establish answers to questions about its desire and authority to promote public safety and well being, protect the environment, encourage commerce and control development. These basic objectives find definition in a mission statement, general and specific policy statements which may address such things as drainage levels-of-service, service areas, standards, construction requirements, erosion control, water quality goals, floodplain control and zoning restrictions.

Typical basic mission and policy statements are normally designed to accomplish the following seven foundational goals within the context of the local government's authority and willingness to develop activities and programs to carry out the mix of the seven foundational goals:

- protect life and health
- minimize property losses
- enhance floodplain use
- ensure a functional drainage system
- protect and enhance the environment
- encourage aesthetics
- guide development.

Based on these foundations the following mission statement as described in Policy Paper #1 was adopted by the City staff:

> **The mission of the City of Griffin's stormwater management program is to develop, implement, operate, and adequately and equitably fund the acquisition, construction, operation, maintenance, and regulation of stormwater drainage systems. The program shall safely and efficiently control runoff, enhance public health and safety, facilitate mobility and access to homes and businesses during**

and after storm events, protect lives and property, complement and support other City programs and priorities, eliminate the discharge of pollutants to receiving waters, and enhance the natural resources of the community.

Program Priorities

Four key factors have been considered in formulating proposed program priorities: 1) the type of drainage problems to be addressed; 2) what must be done to correct the problems, including consideration of financial, legal, and political obstacles; 3) how the solutions can be funded; and 4) the implementation steps and timing required. The recommended program priorities focus on developing and implementing a comprehensive, cohesive approach to stormwater management, with emphasis on immediate attention to correcting highly visible drainage problems throughout the City.

The significant changes implied by these priorities demand that a "building block" approach be employed. The stormwater problems in and around Griffin have not developed overnight. A quick fix is neither realistic nor practical. It is not realistic to expect that solutions to every problem can be attained in a year or two, or even a decade. Some things will have to be deferred while others are accomplished.

Based on Policy Paper #1 the City adopted stormwater management program priorities for the next five years. These are outlined below.

Administration, financial management, and program development

Administrative and support services, personnel resources, and data required to implement operating programs and make capital improvements need to be in place and/or upgraded according to a schedule which ensures that functions and projects dependent upon them are not delayed. Everything need not happen at once, nor should it. The administrative, information management, and other support demands these entail need to be recognized and met The following priorities under this functional area are considered necessary by the consulting team:

A1. Establish a stormwater utility as an administrative and financial focus.

The most immediate priority is to establish a utility and implement service charge funding. This, along with several other priorities serve as a foundation enabling all other program priorities to be carried out.

A2. Define stormwater problems and needs in the city more specifically.

This program priority adopted by the city is partially carried out by section 2 of this report. However, there will be a need to establish the locations and types of problem as a prelude to a more advanced capital improvements and remedial maintenance program.

A3. Formally adopt a program and financing strategy.

Sections 6 and 7 of this report represent the planning stages of the adoption of a program and financing strategy. This strategy will be translated into a cost of service, rate structure analysis and rate study during the development of the utility.

A4. Establish equitable, adequate, and stable stormwater program funding.

This project is designed to bring about the fulfillment of this program priority.

A5. Plan and execute organizational and staffing changes.

At present the organization is not designed to focus significant manpower and resources on the operation of the stormwater system, nor the coordinated correction of the numerous drainage problems. This priority seeks to both add staff in key areas and to reorganize the deployment of current staff.

A6. Conduct public information activities in support of the program.

The public perception that the program is effective is almost as important as the effectiveness of the program itself. In the interim period between when the first bills go out and when the program is growing and beginning to solve long-term problems there is a need to keep rate payers informed of the programs progress and specific activities. Also, when the stormwater utility is in its formation it is important to gain public support for the new funding method.

A7. Enhance management and record keeping systems.

Current systems of keeping complaint records, repair and work orders and other systems should be upgraded both to provide statistics on progress and activities and to support public education efforts and increase customer service options.

A8. Explore interlocal agreements to optimize local government resources.

There may be ways to share data collection, mapping, and other costs with county and other local municipal government entities as well as other staff entities and utilities.

A9. Explore and enhance use of appropriate technology including Geographical Information Systems (GIS).

The geographic and database manipulation capabilities of GIS and other technologies should be implemented at an appropriate level to support other program initiatives.

Stormwater quality management

Congress is developing guidance for the next tier of cities and counties (Phase II). there are some things that Griffin can accomplish now in order to properly position itself to take advantage of the inherent flexibility in the proposed new directions for the NPDES program for stormwater quality.

S1. Identify potential NPDES stormwater quality permit requirements.

Griffin should track the activities taking place at the Federal level through the Internet or other means.

S2. Define a stormwater quality management strategy.

A strategy to take advantage of opportunities should be programmed into the five-year planning process and budgeted within the cost of service analysis.

S3. Identify locally practical Best Management Practices (BMP).

Congress and EPA envision a flexible and staged use of BMP's in the next tier of NPDES permitting. Griffin should prepare itself for this approach by looking to non-structural and programmatic means of reducing pollution to its stormwater system and to properly planning for new development in annexation areas.

S4. Identify retrofitting opportunities for stormwater quality.

As Griffin replaces its stormwater drainage system it should incorporate planning and design for reduction of potential pollution to the maximum extent practicable.

Engineering and planning

The City should balance planning and doing. Some capital improvements can be designed "on the hood of a truck" while others require better system-wide planning. Because Griffin is anticipating a large annexation in the near future it should incorporate master planning of these areas, especially in terms of regional flood control solutions and keeping construction out of the way of both existing and future floods.

E1. Prepare a detailed stormwater system inventory.

An accurate, complete, and up-to-date inventory of the drainage systems must be assembled, including information on easements, rights-of-way, and rights-of-entry and the current condition of the systems. The capacity of the systems to meet current and future demands must then be determined through engineering analysis, and plans formulated for improvements. This information is a prerequisite for upgrading routine and remedial maintenance and building capital improvements.

E2. Develop a stormwater master plan for capital investment.

Some of the system should be planned in a systematic way and a priority system established to program capital improvements.

E3. Design capital improvements for high-priority projects.

The City has a list of capital improvements totaling about $8M. There is an anticipated $40M in necessary capital construction in the current City area. The annexation area also has capital needs though they are unknown at this time. Design has been completed on many of the capital projects. Some of the more high priority ones should be constructed ahead of master

planning both due the pressing need and to demonstrate the programs effectiveness. Sales tax money can be leveraged for this purpose.

E4. Develop technical support resources for stormwater operations and regulation.
These resources include complaint tracking, a routine and consistent inspection program for new development, master planning, and an ability to perform "what if" analysis on proposed new developments to avoid building new problems.

Operations

O1. Prepare and maintain a system condition survey.
The inventory suggested under E1 should include a "condition" assessment. This assessment will then factor into the maintenance program and help assess both the current need and serve as the basis for work orders in the future.

O2. Define the extent, scope, and level of routine maintenance services.
Because the maintenance need is so large compared to the current city resources, it is important to define the City's policies in terms of where it will maintain, what it will do, and to what level it will strive to maintain the system. These standards will shift in time as the City acquires maintenance easements and brings more and more of the system up to an acceptable standard. The eventual goal is to have the whole of the City drainage system (both private and public) defined and standards set for each section or type of system.

O3. Evaluate privatization of maintenance.
It may be cost effective for some types of maintenance requiring specialized skills, irregular demands, or expensive equipment to be handled by private vendors, at least in the short term.

O4. Develop a routine maintenance strategy and identify priorities.
Routine maintenance is defined as those activities which are done without regard to the demands of complaints. They are the things the City will do "routinely" in a regularly scheduled way. This may include routine inspections of portions of the system, routine catch basin cleaning, etc. As the City becomes familiar with the maintenance needs of the system and grows in its capacity to meet these needs this portion of the maintenance program is expected to grow in importance.

O5. Develop a remedial maintenance strategy and identify priorities.
Remedial maintenance is the repair and replacement of existing systems, the restoration of an existing system to its original capacity. The development of a strategy and priority list for this type of program is important because this is the area the City can best demonstrate its commitment to "doing" not just "planning to do". The needs are greater than the capacity and will stay that way for a number of years. It may be that some parts of the system can be restored as a stop-gap measure, even though it is known they are undersized.

O6. Establish and conduct expanded routine and remedial maintenance programs.

The program will expand with the planned addition of crews and equipment, as well as technology. This growth should be controlled and managed in a logical "building block" fashion.

Regulation and enforcement

R1. Upgrade City regulations, codes, and requirements.

The City needs to review its guidance and requirements in light of its program goals and objectives and in light of improved design technology and computer resources. The past ills created by improper design and construction should be fully identified and corrected through both regulatory and programmatic changes and improvements.

R2. Develop an inspection program to verify maintenance of key private stormwater systems.

Some of the system, particularly detention systems, are privately constructed and maintained but have a public impact. These important systems should be identified, cataloged and placed into an inspection program. Guidance and maintenance requirements should be spelled out and technical assistance given where appropriate.

Capital improvements

C1. Identify and acquire land, easements, and rights-of-entry for capital improvement and operating needs.

Properties and easements necessary for the stormwater program should be acquired as soon as funds become available, especially in areas likely to be subject to development or redevelopment in the near future. The City should also look for other avenues that will aid and support the acquisition of key properties, such as amendments to subdivision and zoning ordinances to ensure dedication of permanent drainage easements on private property.

C2. Plan and construct capital improvements based on master planning studies.

Master planning studies will identify regional, systematic capital investments both to fix existing problems and to avoid new ones in the annexation areas. These capital improvements should be programmed into the CIP program along with the other more minor construction.

C3. Plan and construct critical structural BMPs for stormwater quality.

It may be that the City identifies capital construction needs which will have a primary water quality basis. This type of construction should be woven into the overall capital program along with construction whose primary purpose is stormwater quantity control. All construction should take into account potential improvements in water quality from design modifications.

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SECTION 5 INSTITUTIONAL OPTIONS

Overview

Because the Action Plan proposes steps necessary to attain more effective stormwater control in Griffin, institutional considerations influencing management and funding decisions are of special concern. Two aspects need to be addressed in developing and implementing a comprehensive stormwater management program, especially when funding is a key issue and innovative options like a storm water "utility" are being examined. They are: 1) the authorities and constraints that prevail in the institutional environment, most notably in the state constitution and legislation and case law decisions; and 2) the local organizational and management setting and options available for the program.

This section examines constitutional and statutory provisions and case law decisions likely to dictate or at least influence the setting within which the City's future stormwater program will operate and the organizational/management options that exist. A cautionary disclaimer must be expressed. Technical legal issues should be referred to the City's legal counsel. This may extend to bonding issues that should be referred to special bond counsel familiar with the City's general obligation and revenue bond debt circumstances. The findings, conclusions, and recommendations in this report do not constitute legal advice or any assurance, expressed or implied, regarding the legality or financial soundness of any options examined in this report.

The institutional environment is fundamentally positive. Municipalities in Georgia have strong authority and powers to carry out their basic responsibilities of protecting the health, safety, and welfare in their communities, including specific authority (some would say responsibility) to manage stormwater runoff. Georgia's cities enjoy home rule authority provided by the constitution. Home rule allows them substantial decision-making flexibility to meet local needs in creative ways, and enable diverse organizational and funding solutions. Cities' powers of taxation and debt are limited, however.

Organization and management of the program may be of more immediate importance to local elected officials, citizens, and the City administration than the somewhat esoteric topics of institutional authority and constraints. It is important to correlate the program needs, priorities, and the institutional opportunities to organizational and management options so that a successful strategy can be identified. The existing organizational and management setting is examined and options are identified. However, the Action Plan is not intended to be an analysis of the City's or even the Public Works Department's organizational structure. Thus, this section provides a high-level assessment of the organizational and management needs implied by the stormwater program and compares those needs to the existing structure and options.

The existing organization and management approach to stormwater control are typical of small cities which have limited resources and broad responsibilities. Stormwater management is an important priority but only one of many under the Public Works Department. The organization and management approach reflects this reality. Staff and financial resources must be continuously allocated among competing needs. As a result stormwater needs often more to the front only in response to the impact of relatively infrequent severe storm events. This creates is situation in which it is difficult to plan with any certainty for long-term capital investment or ensure consistent levels of routine and remedial system maintenance. One of the most important contributions that a stormwater utility potentially offers to the community is the stabilizing financial influence it implies, which will allow long-range capital and program planning to be done with confidence.

Institutional Environment

Assessing the institutional environment involved substantial research into constitutional and legislative provisions and case law decisions which will guide the City's approach to stormwater management. The examination was general in nature and geared to basic feasibility decisions rather than technically detailed to support specific actions or approaches. The following articles and sections of the Georgia Constitution and the Official Code of Georgia Annotated were examined in the course of this analysis.

Georgia Constitution

- Article III, Section 6, paragraph V; Specific Limitations on the General Assemblies powers to regulate or fix charges of public utilities owned by a county or municipality
- Article IX, Section II, Paragraphs I to IX; Home Rule
- Article IX, Section II, Paragraph VIII; Limitations on Local Taxing Power
- Article IX, Section V, Paragraphs I to VII; Local Debt Limit
- Article IX, Section VI, Paragraphs I to V; Local Government Bonds

Official Code of Georgia Annotated

- Sections 32-1-1 to 32-1-11; Highways, general provisions
- Sections 32-4-90 to 32-4-94; Highways
- Sections 32-3-30 to 32-3-39; Highway Rights-of-way.
- Sections 36-29-1 to 36-39-34; Streets
- Sections 36-34-1 to 36-34-40; Municipal Corporations generally
- Sections 36-35-1 to 36-35-8; Home Rule
- Sections 36-36-1 to 36-36-92; Annexations
- Sections 36-38-1 to 36-38-23; Municipal Bonds
- Sections 36-68-1 to 36-68-3; Merger with County
- Sections 36-71-2 and 36-82-81; Stormwater defined
- Sections 36-73-1 to 36-71-13; Development Impact Fees
- Sections 36-82-60 to 38-82-85; Revenue Bonds
- Sections 36-82-120 to 36-82-124; Interest Rates
- Sections 48-5-350 to 48-5-361; Property Taxes

- Sections 50-14-1 to 50-14-6; Open Meetings

The most significant findings drawn from analysis of the constitutional and legislative environment relate to the City's basic authority to manage stormwater, the breadth of its funding options, and limitations which apply.

The Home Rule authority provided to cities in the Georgia Constitution (Article IX) is relatively broad and enabling rather than constraining. Along with the normal general powers of local government, it specifically includes powers to perform certain "supplementary functions". These include the authority to operate "storm water and sewage collection and disposal systems", in Article IX, Section II, Paragraph III, (6). The legislative authority accorded municipalities in Section 36 of the Official Codes of Georgia Annotated further supports the broad constitutional authorization of Home Rule authority.

The Home Rule article does not specify how cities should organize or fund local governance. Rather, it essentially allows cities to organize and fund functions as deemed appropriate by the local legislative authority, in this case the Griffin City Commission. As long as an approach is not contrary to taxing, indebtedness, or other limitations contained in the Constitution, it would appear to be preemptively authorized.

Assuming that cities are broadly authorized to use a utility to manage and fund stormwater control if they wish, what authority does the General Assembly have to limit the City's exercise of its authority? Since the definition of specifically authorized supplementary functions groups "storm water" with "sewage collection and disposal systems", and given that sewage collection and disposal has historically been funded through service charges by many cities, one could conclude that the Home Rule article anticipates that stormwater management might be funded and managed in a like manner by municipalities. This construction would seem to preclude the General Assembly from potentially prohibiting cities' use of utility service charge funding to support supplementary functions authorized by Home Rule, including stormwater management, because the authorization is constitutionally derived. It appears that the General Assembly is also restricted from regulating or fixing the charges of public utilities owned or operated by a municipality by the Home Rule article (Article IX, Section VI, Paragraph V).

The Home Rule authority is supported by specific legislative language. Under Section 36-35-3 of the Official Codes of Georgia Annotated, the City has the authority to enact ordinances, rules, and regulations relating to its property, affairs, and local governance. What all of this means is that the City Commission appears to be free to act under both constitutional Home Rule and the legislatively-granted authority to organize, manage, fund, and account for its stormwater management program in the manner it deems best. This should include establishing a "stormwater utility", adopting stormwater service charges to support both the operating expense and capital investment of the utility, and defining rules and regulations applicable to private properties' use of and impact upon public drainage systems.

Other stormwater management options would appear to be available as well under the broad Home Rule authority. Article IX, Section II, Paragraph VI allows cities to establish "special

districts" as a means of organizing and funding some operations and improvements, with funding being possible through taxes, fees, and/or assessments. However, the case of Martin v. Ellis appears to limit cities' flexibility in using special districts.

The Martin v. Ellis decision finds that cities may not establish special districts for the purpose of taxing for some services at different rates in different areas. Since the decision specifically denotes, fees, assessments, and taxes, this limitation would appear to extend to services charges as well as other forms of funding supportive of a special district. This is not to suggest, however, that the City Commission would be prohibited from establishing differential stormwater service charges by service area or zone in the city to support a stormwater utility that provides demonstrably different levels of service if that is their opinion of the best way to distribute the cost across the community.

Other constitutional provisions of interest include provisions for intergovernmental contracting for a period not to exceed 50 years (Article IX, Section III, Paragraph I), a limitation of 10 percent of assessed valuation on total municipal debt, and exclusions of revenue bond debt from the debt limit (Article IX, Section V, Paragraph I). These provisions do not unduly restrain the cities ability to properly organize and fund a stormwater management program.

Organizational Structure and Management Approach

The organization structure and management approach likely to work best in Griffin for an expanded and upgraded stormwater program will be one that takes advantage of the existing resources of the City and fits with the program mission and priorities identified earlier in this report. The experiences of other cities which have established similar stormwater utility programs suggest that: 1) a significant expansion will occur in the breadth and the level of service provided, demanding additional labor, capital, and management system resources; and 2) increases in operating and capital expenditures creates greater program and financial management demands. The implication is that the existing organizational structure and management approach and systems may have to be changed to efficiently carry out the stormwater program.

Three potential impacts stand out. First, more staff will be needed. The primary intent in establishing a stormwater utility is to provide a higher level of service in the form of enhanced operations and more capital improvements. This requires more operational capability, more engineering and planning support, and a higher level of management and technical skills. Labor needs range from additional field crews to relatively sophisticated engineering skills. These needs can be met through a combination of in-house hiring, contracted support from other city (or county) departments, and private vendors. It also demands a well-ordered program development effort, in which information is assembled, analyses are performed, and projects are built or conducted over several years. The capacity to manage this program development process is absolutely essential.

The second major impact stems from the increase in visibility and accountability that is associated with establishment of a utility. The City's organizational structure and management systems must be capable of responding to elevated visibility and public contact. The City's responsibility for

stormwater management will be advertised to citizens and business owners each month in the form of a new line item service charge on their utility bills. Customer service demands will increase substantially. Political acceptance of a stormwater utility is highly dependent on the City's ability to establish and maintain public confidence in the program.

The third impact is the increased demands on the management and support systems that will be the foundation for the stormwater program. For example, billing, collection, and accounting of service charges implies a greater burden on the City's financial management systems and personnel. The City's computer systems may have to be upgraded and more staff may have to be added. As the program evolves similar demands will be placed on systems needed to support operational, regulatory, engineering, and capital project management.

These impacts have several immediate implications for the Public Works Department and other City organizations. While a major organizational change is not immediately needed in the Public Works Department, it appears desirable to increase the "identity" of stormwater management by establishing a Stormwater Division as part of the transition to a "utility". A division-level organizational entity will properly focus the increased visibility that the program will have.

Figure 1 on the next page graphically depicts the likely organizational structure of a Stormwater Division if a utility is established. The actual number of additional City employees will be determined as the City's management team evaluates the efficiency of in-house hiring versus contracting with other City departments or outside vendors. Those position blocks which have fine outlines represent new or planned positions to enhance the stormwater program capability and bring about fulfillment of the program priorities. The thick-bordered positions are existing positions which will be reorganized. This organization depicts primarily the operations segment of the program, that which is most manpower intensive. It is anticipated that there will be two new drainage maintenance crews along with supervisors and an engineering technician.

Management and support systems will also be affected by the formation of a stormwater utility. The City's financial management systems, and especially its existing utility billing system, are likely to be immediately impacted. Adding another line item (stormwater) to the existing utility bill is a relatively simple step, but it has numerous other spin-off impacts. There will be several hundred "stormwater only" accounts for properties which do not currently have water, wastewater (sewer), or electrical service but will be charged for stormwater management. Billing and payment histories will have to be provided for, and delinquency collection processes should be driven directly off the billing system. Most stormwater utilities allow credits for properties having on-site systems that mitigate the demands they would otherwise place on public stormwater systems and programs, which must be incorporated into the billing system.

Technical support systems must also be upgraded at a pace comparable to the changes in the program. Master planning of stormwater systems at the watershed level and implementation of preventive maintenance practices will require that detailed inventories of the systems be assembled. These inventories will need to include physical dimensions, system condition records and extrapolated profiles of needs, and access availability in the form of easements, rights-of-way, and rights-of-entry. Once master plans are approved, a capital improvement program will be

inaugurated that will demand enhanced project management capability. A maintenance management system will be needed at some point.

In summary, establishment of a stormwater utility will inevitably have far-reaching impacts on the City's organization and management approach and systems. Fortunately, the transition to a utility and full realization of the projected stormwater program will take several years. This will allow the changes to occur as evolutionary adjustments rather than an upsetting revolution of the current structure, approach, and systems.

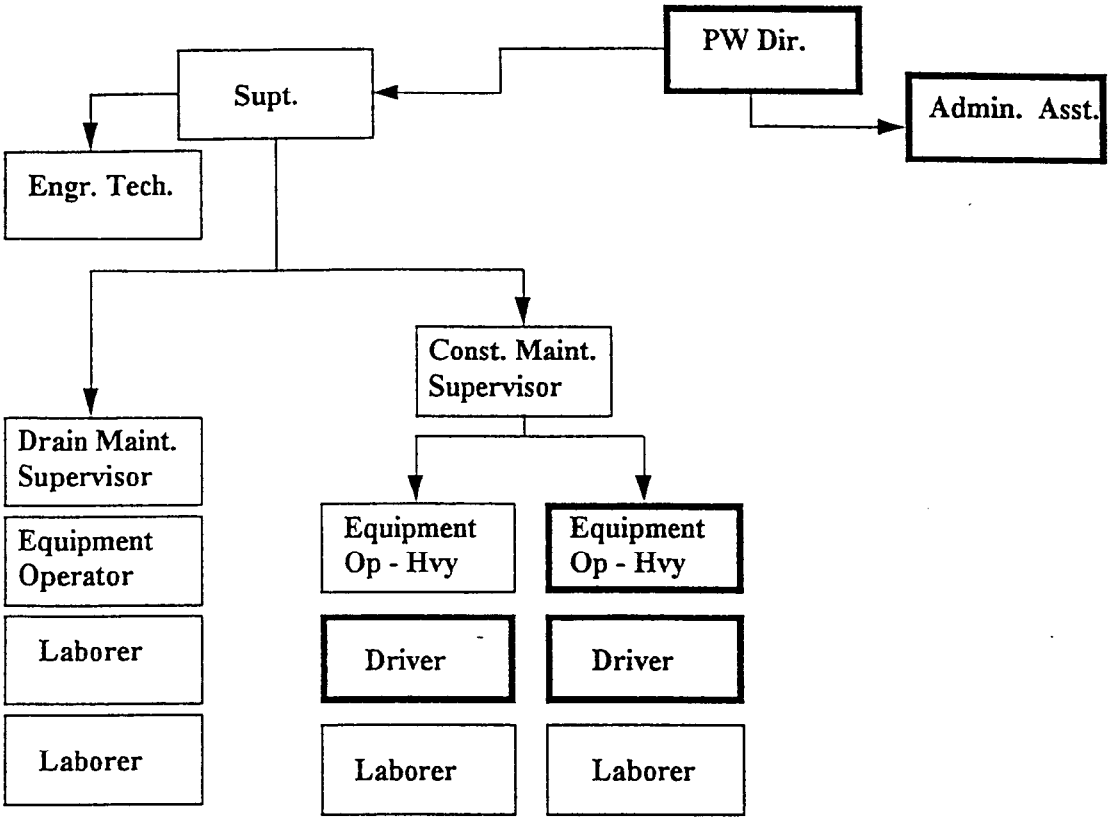

Figure 1 - Projected Stormwater Division Organizational Structure

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 6 PLANNED PROGRAM

Overview of Planned Program

The program priorities established in Section 4 and the program organizational issues in Section 5 are translated into basic program directions in this section. This section will not detail specific program costs but will attempt to assess overall costs and changes in the current program for the next five years. The chart below gives a basic layout of the major thrusts of the main parts of the proposed program.

Major Elements of the Planned Program

Program Element	1998	1999	2000	2001	2002	Ongoing
Add one Crew for Operations and Maintenance						
Add another Crew for O & M						
Local Option Sales Tax CIP Program						
Establish Basic GIS Capability						
Inventory System						
Develop GIS Applications						
City-wide Master Planning						
Extended Capital Construction Program						

The major thrusts of the program for the next five years (and beyond in some cases) will include:

- an immediate increase in both routine and remedial maintenance capability through the addition of another maintenance crew;
- construction of high priority capital improvements; and
- improvement of technical capabilities.

Annual Highlights

The program priorities from the Section 4 are arranged by the year in which they are expected to either begin or have most of their activity. The highlights year by year are given here. See Section 4 for more details about the program priorities.

1997

- Establish stormwater utility and administrative organization (A1, A3, A4, A5)
- Conduct public education and awareness activities (A6)
- Define problems more specifically (A2 - and ongoing)
- Enhance record keeping on an interim basis (A7)
- Explore and set direction for stormwater quality (S1)
- Establish policy on operations and maintenance (O2, O3)

Preliminary Cost Estimates for Stormwater Program
(1997 dollars)

#	Program Element	1997	1998	1999	2000	2001	2002	On-going
EXISTING PROGRAM								
1	Administration	50	50	50	50	50	50	50
2	Operations & Maintenance	400	400	400	400	400	400	400
3	Capital Improvements	100	100	100	100	100	100	100
PLANNED PROGRAM								
4	Billing and Indirect cost		60	60	60	60	60	60
5	Rate Study			25			25	
6	Add two personnel		90	90	90	90	90	90
7	Add one Crew for O & M - Equipment		180					
8	- Operations (mid-yr.)		85	170	170	170	170	170
9	Add one Crew for O & M - Equipment				180			
10	- Operations (mid-yr.)				85	170	170	170
11	Fly City, Ortho photos, digital mapping	**50**[1]		**100**	100			
12	Establish Basic GIS Capability	**25**	**25**					
13	Inventory System		**50**	**50**	**50**			
14	Develop GIS Applications			50				
15	Stormwater Master Planning ($450,000 total)[2]			50	100	100	100	
16	SPLOST Capital Construction Program	**150**	**200**	**100**	**200**			
17	Extended Capital Construction Program					200	200	200
18	**TOTALS**	775	1240	1245	1635	1340	1365	1240

[1] Note - bold totals are expected to paid from SPLOST funds

[2] Master planning continues for another year only and is not ongoing after that.

Cost Details

Details from the table above, by line number are given in this sub-section.

Lines 1-3 These are the existing program costs simply carried forward through the duration of the 5-year program. These costs include basic administration, current operations and maintenance functions and a basic minor system capital improvements program.

Line 4 Billing cost includes all indirect overhead allocations to the utility, and can vary in terms of definition, depending on how it is considered by Finance. The bill is expected to be sent out on the Water and Sewer bill along with the other utility billed items. We anticipate that stormwater will pay a share of the cost of sending bills. This initial estimate was made by City staff.

Line 5 There will be a need for a rate study to set the rate for the next rate period. This rate study will make "in course corrections" to the program cost of service estimates and calculate a required revenue, rate adjustment and rate period.

Line 6 Two maintenance support personnel are expected to be added at the initiation of the

stormwater utility. The first will be a maintenance superintendent in charge of all stormwater inspection and maintenance activities. Salary is expected to be in the $35,000 range. The second is an engineering technician to support capital construction, GIS applications, CADD operations, and general engineering design support. Salary is expected to be in the $25,000 range. The benefits multiplier is taken at 1.5 making the total of these two personnel $90,000 annually.

Line 7&9 Two identical maintenance crews are anticipated as depicted in Section 5. The equipment to be purchased to support each of these crews is anticipated to include: a backhoe, low boy trailer, dump truck, crew-cab pickup truck and other miner equipment.. The total capital equipment cost is estimated to be $180,000 per crew.

Line 8&10 The personnel to be hired for each of these crews are depicted in Section 5. The estimated salaries plus the 1.5 benefits and overhead multiplier and all other operating costs (about 1/3 the total) amounts to $170,000 annually. Half this amount is estimated in the first year as the crews are expected to begin operations in mid-year.

Line 11 We anticipate flying the city to produce orthophotography in 1997. These photographs will be used in development of the master account file for the utility. The ground control and flight will be arranged such that digital planimetrics and contour maps can be derived from the same overflight in 1999 and 2000 when that information will be needed for the system inventory and master planning of capital improvements.

Line 12 Initial PC-based GIS capability will assist the City in keeping track of complaints, inventory information and in being able to assess the impacts of new development (among other things). If the capability comes on line in time it might be used to assist in the development of the utility master account file. If not, Ogden will use its own resources and the GIS will be used later. There may be other entities who will want to take advantage of the GIS capabilities as funding partners. This should be -- explored, but not at the expense of making progress in getting up and running.

Line 13 An inventory of the system is anticipated to cost about $150,000. We anticipate using the GIS system and digital planimetric mapping to serve as the base for the inventory data. Prior to the inventory decisions will need to be made on how the data will be used and by whom. This then will dictate what type and to what accuracy the data will need to be collected, and the actual cost. We recommend using GPS based collection systems if possible.

Line 14 GIS applications may include the areas of master planning, inventory tracking, maintenance management, and model applications. A budget of $50,000 is allowed here as an estimate of both the City's ability to fund applications and those applications which might be seen as useful.

Line 15 Master planning will probably consist of assessment of the flow capacity of the primary drainage system and making capital improvement recommendations. There may be a need to develop a model of the annexation areas in anticipation of new development and potential regional solutions. As such, the master planning will use the inventory information and the mapping. It will directly feed the capital construction program both under SPLOST and later.

Line 16 This line includes SPLOST funded capital construction. Other bold items in the table are also expected to be funded from SPLOST because they directly support the

construction program. The total SPLOST funds are about $1,000,000.

Line 17 This line is the continuation of the construction program but not under SPLOST funding.

Line 18 This line is the total program cost expected to be funded from all sources of revenue.

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 7 FUNDING FEASIBILITY

Overview

This ***Action Plan*** puts forth a strategy for establishing, developing, and implementing a stormwater utility. The source or sources of funding to be used is a core issue in formulating that strategy. This section of the Action Plan addresses the feasibility of funding the stormwater program strategy identified above through a utility supported primarily by service charges.

Stormwater utilities are comparable in many ways to more traditional water supply and wastewater treatment utilities. Nearly all involve management of a complex system of natural and man-made physical structures, and demand continuing operational and regulatory programs as well capital investment in the systems. Most provide a comprehensive program that addresses water quality as well as quantity (flood) control. However, no "cookbook" approach to funding stormwater utilities exists.

Virtually every stormwater utility has a unique service charge methodology. Many use other secondary funding methods or sources of revenue to support one or more specific components of their programs, such as plan review and inspection fees for development review activities. Thus, the funding feasibility of utility service charges and other funding methods and sources of revenue should be assessed in the context of the needs that prevail in Griffin and the resulting strategy tailored to those needs as well.

The program in Griffin has a steep "development curve" ahead in the next few years as administrative, operational, capital investment, and regulatory elements are formulated and carried out. It will take five to ten years before a comprehensive program is fully attained. Funding should be expected to evolve along with the program. Full implementation of funding associated with a stormwater utility may therefore require ten years or more.

This section of the ***Action Plan*** summarizes how the utility approach might best be supported by service charges in Griffin's circumstances and how they can best be implemented. A separate, more detailed ***Analysis of Funding Feasibility*** has been prepared which examines the full range of options available to the City, including the special local option sales tax (SPLOST) which has been approved and will be used in part to fund capital improvements to the stormwater systems in the next few years.

The ***Analysis of Funding Feasibility*** concludes that a stormwater service charge is in fact the most viable long-term funding method for the program. A stormwater service charge offers stable and adequate revenue capacity along with the opportunity to design a rate methodology that results in an equitable distribution of the cost of services and facilities. Service charge rate structures typically are designed to distribute costs based on the demands placed on the stormwater systems and programs. The ***Analysis of Funding Feasibility*** also examines several ways of augmenting a standard stormwater

service charge in the addition to the SPLOST, which offer opportunities to enhance both equity and revenue sufficiency under the utility approach.

Influence of Policy Recommendations on Funding Feasibility

A series of policy issues has been separately examined and documented in "policy papers" which recommend positions supportive of the utility approach examined in this ***Action Plan*** (See Appendix A of this report). These policy positions directly impact the feasibility of the utility and the various funding methods that might be associated with it, and will dictate to some degree how the implementation process should proceed if adopted by the City. In summary, the policy papers recommend the following:

1. The City should establish a stormwater utility as a separate cost center encompassing the full range of services and facilities associated with stormwater quantity and quality management, ranging from flood control to water quality management.

2. The stormwater utility should be funded primarily from service charges. The stormwater service charge should be on the same bill as the water and wastewater charges, and should appear as a separate line item.. The rate algorithm for stormwater service charges should be fair and reasonable and result in charges that bear a substantial relationship to the cost of services and facilities.

3. Bonds should be used to pay for major capital improvements to the stormwater systems, but should be limited to projects and acquisitions which are beyond the capacity of the service charge to fund through its annual revenue stream.

4. Special service charges should be used to equitably assign certain costs of service to individual properties or utility customers receiving services not provided generally throughout the service area, including but not limited to plan review and inspection services.

5. Service charge credits should be provided for properties which have on-site stormwater management facilities, where practices are conducted which mitigate peak flow, total volume, and pollutant loading impacts on the public drainage systems, or where distinctly lower levels of service are to be provided as a matter of policy.

6. System development charges should eventually be used to distribute capitalization costs over time, but are not needed until City adopts and begins implementation of a major capital improvement plan.

7. Impact fees, in-lieu of construction fees, and developer extension fees should not be used to fund stormwater systems or operations.

8. The City should seek and accept state and federal funding in support of the stormwater management program only in instances where such funding is consistent with local

- Additional funding from other sources, including but not limited to the SPLOST, appears to be needed to accomplish a comprehensive stormwater program that provides capital investment as well as operational enhancements.

- Several rate methodologies, including but not limited to an impervious area approach, would meet the conventional legal tests that have been applied to stormwater charges elsewhere and would be appropriate in Griffin.

- The existing databases and data processing systems have not been fully evaluated to determine if they can be used for billing a stormwater service charge, but it appears that a timely and cost-effective approach can be instituted.

Detailed Feasibility of Utility Funding for Stormwater Management

Above and beyond the institutional/legal concerns addressed in Section 5 of this ***Action Plan***, the issue of the basic feasibility of utility funding for stormwater management raises three questions: 1) whether a utility can generate sufficient revenue from various sources to fund the program within the anticipated willingness-to-pay limits of the community; 2) whether a service charge rate can be designed which properly meets the legal tests commonly applied to utility rates; and 3) whether a service charge can be implemented expeditiously and efficiently.

Service Charge Revenue Requirement

In the previous section the preliminary stormwater program and service charge revenue requirement was developed based on a planned five-year stormwater program growth. That program was, in turn, based on the program priorities from the previous section. The table below reproduces this expected cost adding revenue requirements. Note that all program costs are accounted for in this table, including those to be paid for out of SPLOST funds. The bottom line of the table is the revenue requirement expected to be paid from the stormwater utility funds.

Note that the first two years of utility funding are at a significantly lower level than the years after that. Based on this change in revenue requirements in the year 2000 (termed the "First Rate Period") we anticipate that a rate adjustment will be made at that time. This is due to SPLOST funds being exhausted by this time or shortly thereafter and a need to cover all capital construction costs from utility funds rather than SPLOST revenues.

Preliminary Cost and Revenue Estimates for Stormwater Program
(1997 dollars)

			First Rate Period		Second Rate Period			
#	Program Element	1997	1998	1999	2000	2001	2002	On-going
EXISTING PROGRAM								
1	Administration	50	50	50	50	50	50	50
2	Operations & Maintenance	400	400	400	400	400	400	400
3	Capital Improvements	100	100	100	100	100	100	100
	PLANNED PROGRAM							
4	Billing cost		60	60	60	60	60	60
5	Rate Study			25			25	
6	Add two personnel		90	90	90	90	90	90
7	Add one Crew for O & M - Equipment		180					
8	- Operations (mid-yr)		85	170	170	170	170	170
9	Add one Crew for O & M - Equipment				180			
10	- Operations (mid-yr)				85	170	170	170
11	Fly City, Ortho photos, digital mapping	**50**[1]		**100**	100			
12	Establish Basic GIS Capability	**25**	**25**					
13	Inventory System		**50**	**50**	**50**			
14	Develop GIS Applications			50				
15	Stormwater Master Planning ($450,000 total)[2]			50	100	100	100	
16	SPLOST Capital Construction Program	**150**	**200**	**100**	**200**			
17	Extended Capital Construction Program					200	200	200
18	**TOTALS**	775	1240	1245	1635	1340	1365	1240
19	**SPLOST Totals**	225	275	250	250			
20	**Total Service Charge Revenue Requirement**	550	965	995	1385	1340	1365	1240

[1] Note - bold construction related numbers are anticipated to be paid from SPLOST funds
[2] Master planning continues for another year and is not ongoing after that.

Revenue Sufficiency

The preliminary cost of service estimate contained in Section 6 of this ***Action Plan*** provides a revenue objective for all elements of the stormwater program. This is one-third of the information needed to determine whether a service charge acceptable to the community is capable of generating sufficient revenue to support the program. The other two elements of the equation are the amount of revenue likely to be available for stormwater management from other sources and the size of the rate base to which the service charge will be applied.

The practical likelihood is that the other revenue sources available to fund stormwater management activities and/or projects during the next few years, other than the current budgeted program funded through General Taxes, are limited to plan review and inspection fees and the

SPLOST previously approved by Griffin voters. To determine how much money will have to be raised through service charges, the revenue potentially available from these other sources must be estimated. In addition, it must be determined whether or not the funding from various sources can offset service charges. In many cases, revenue sources have legal, practical, or political limitations that dictate how they are applied to stormwater management needs and the extent to which they may offset service charge revenues.

For example, the SPLOST will provide funding for some stormwater capital improvements over the next five years. SPLOST funds cannot, however, be used for salaries of field crews and therefore cannot offset service charge revenue for that purpose. In any case, SPLOST does not appear to offer sufficient funding even to meet all stormwater capital investment needs much less operating expenses. As a result, some service charge revenue will probably have to be allocated to capital investment even though SPLOST revenue is also available for the next few years. Thus, the funding available from SPLOST can be deducted from the stormwater capital investment revenue requirement but not the total program revenue requirement.

Likewise, plan review and inspection fees are limited in terms of the level of fees that can be justified, the revenue they generate, and the use of the revenue. Such fees can be established incidental to the exercise of the City's general police powers to regulate activities that affect public health, safety, and welfare. Alternatively, they may be adopted under the umbrella of a stormwater utility service charge rate structure as part of the system of stormwater fees. If adopted as an element of the stormwater rate structure, plan review and inspection fees must be designed to meet the standards applicable to utility fees generally. The most common test applied to utility rates is whether the charges are "fair and reasonable, and bear a relationship to the cost of providing the service or facility." Thus, plan review and inspection fees cannot be unreasonably inflated in an effort to fund other program elements such as system maintenance.

The total annual cost of stormwater management, including operating expense and capital investment, is estimated to range between $1,000,000 and $1,400,000 during the five-year period addressed in the strategic program plan. Stormwater capital expenditures from SPLOST revenues will total about $1,000,000. Other revenues such as plan review and inspection fees, if enacted as part of the stormwater rate structure and assigned to the stormwater utility fund, will probably total no more than $10,000 in any given year. Thus, at a minimum, the stormwater utility service charge needs to be designed to generate in the range of $1,200,000 annually to meet the revenue requirements of the projected program.

The rate base available to a stormwater utility in Griffin is conservatively estimated to be between 20,000 and 30,000 equivalent residential units, depending on the type of rate structure that is employed and how it is applied to residential and non-residential properties. Assuming that the initial willingness-to-pay ceiling in the community is $3.00/per month for residential properties, this suggests that the total revenue stream from stormwater service charges is between $60,000 and $90,000 per month, or $720,000 to $1,080,000 annually. This suggests that a stormwater utility is marginally capable of generating sufficient revenue to support the operating requirements of the program within the assumed willingness-to-pay, but that SPLOST and/or other revenues are critically important if capital investment in the systems is to be pursued.

Legal Tests Influencing Service Charge Design

No single stormwater rate structure is suitable in every community. The most commonly used rate methodologies base service charges on the area of impervious coverage on each property. Impervious coverage is the single most important factor in the peak rate of stormwater runoff from each property, the total volume discharged, and the pollutant loadings contained in the stormwater. These attributes present demands on the systems in terms of physical capacity, operating requirements, and the need for certain support services, all of which involves costs. Other factors such as slope and soil type influence the rate, amount, and characteristics of stormwater runoff, but not nearly to the same degree as impervious coverage.

The association between the demands placed on the stormwater systems and program and the design of a rate methodology has become a key issue in case law decisions on stormwater utilities and rates. Legal challenges have tested stormwater rate design issues up to the Supreme Court level in several states, but not yet in Georgia. Most of the case law on stormwater utilities and rates parallels that of other municipal utilities such as water, wastewater, and solid waste. The basic tests most commonly applied are whether a rate design is "fair and reasonable" and whether it results in charges which "bear a substantial relationship to the cost of services and facilities."

The "fairness" issue relates to how the rate structure treats similar and dissimilar properties. Are similarly-situated properties treated in a similar manner, and are dissimilar properties treated consistently and in a manner reflective on their relative demands on the systems? Is the basis for distinction among various customers under the rate methodology rationale?

The "reasonableness" test asks whether the amount of the service charge makes sense in terms of the services and facilities that must be provided and the value of such services and facilities. Is the amount of the stormwater service charge commensurate with stormwater systems and services provided?

The "relationship of the charge to the cost of services and facilities" is the critical issue, since it is a measure employed in judging the first two issues as well. A "fair" rate methodology that results in charges that are unreasonably excessive would be at risk, because it does not satisfy this test of relationship between the charges and the cost of systems and facilities. If it can be demonstrated that a charge bears a relationship to the cost of providing services and facilities, the fairness and reasonableness questions are largely resolved.

Judicial deference to the authority and judgment of local elected officials in matters of local government finance is an extremely important factor in municipal utility case law. Courts throughout the country have largely deferred to the judgment of local legislative authorities such as city commissions, councils, and boards in determining what is fair and reasonable in the context of local circumstances.

Most case law decisions address the underlying authority and the process that was employed in establishing a utility and service charge, not necessarily on the result in terms of the form of the

rate methodology or the amount of the charges. Assuming that adequate basic authority exists for a city to establish a stormwater utility and service charges, a heavy legal burden falls on the shoulders of a plaintiff challenging a stormwater utility service charge methodology. Unless a plaintiff can conclusively demonstrate that a stormwater service charge rate methodology was adopted arbitrarily and capriciously or is illegally discriminatory in its application, the courts have generally presumed that the judgment of a local legislative body is good.

Expeditious and Efficient Implementation

The transition to a stormwater utility funded wholly or primarily through service charges typically involves highly visible changes in the operating and capital investment programs and budgets. The impact of changes in the form of funding are less well understood, but also significant. The experiences of other jurisdictions indicate that the implementation of a stormwater utility service charge can be a costly and time-consuming process unless care is exercised in the approach selected. Key policy decisions made in formulating the utility concept dictate what must be done to implement the service charge funding mechanism, thus driving the expense and time required for implementation. Upkeep requirements must also be considered.

Because of large amount of revenue involved, time is potentially more costly than the work that must be done to implement a stormwater service charge. Until the potential revenue stream of a utility is actually realized there is an opportunity cost of lost revenue each day that service charges are not being billed. This tends to create an atmosphere of urgency once the decision to establish a utility is reached. In some cases daily cost of an unrealized revenue stream has driven cities and counties to employ fast but very expensive implementation options or to accept a lower level of quality and accuracy that portends higher future costs to resolve problems. Recognizing this, preparations can be made which minimize the opportunity cost of delay without resorting to an unnecessarily costly approach or diminished quality.

Three things must be carefully considered in assessing the implementation implications of various stormwater funding and rate structure options:

1. the initial assembly or gathering of service charge billing data and on-going maintenance requirements, plus the data processing demands of the utility;

2. the processing capability and data storage capacity of the City's existing data processing systems and other options, especially those associated with generating, delivering, collecting, and accounting for service charges; and

3. the potential spin-off benefits that the utility billing data processing needs may create.

The data parameters incorporated into the service charge calculation will determine what information has to be assembled from existing sources and whether new data must be generated in some manner. Two axioms should be recognized, that existing data costs less than new data and that each additional increment of accuracy costs more than the last. Thus, if impervious area

information is directly available from an existing source (e.g., property tax records), it can be assembled less expensively than if new data must be generated.

The greatest drawbacks of most existing sources of data is that they are either not sufficiently accurate and/or a substantial portion of the information in the file is out of date. For example, property appraisal records may have an accurate calculation of the footprint of buildings on a site but paved parking area is not usually accurately described. Both are impervious coverages that should be considered in applying an impervious rate methodology. Even if good figures are available on paved parking area, property appraisal data may not indicate if the area is under the building or separate, which directly relates to the total impervious coverage on a property. Property appraisal data may be updated on a four-year cycle or even longer unless a building permit generates an interim update, and an addition of new paved parking area may not even require a building permit or generate a file update.

The accuracy requirements of a stormwater rate methodology also directly influence costs. If an impervious area rate structure is designed to use precise values in the calculation of the service charges, the implication is that the data must meet tight tolerances. It will cost more to assemble a database that meets this objective than one which uses less accurate data or subjective categories that involve engineering judgment rather than measurement. This is the key reason that most stormwater utilities employ a rate structure that employs ranges or rounding to an incremental value rather than precise numbers.

One of the easiest ways to reduce the time and cost of service charge implementation is to use categories of ratepayers rather than specific values for each account. The most common application of this is through simplified residential charges wherein all single-family residential properties are charged the same flat rate or two or three categories of residential accounts are adopted. If this approach is used it is vitally important that a sample of residential properties be used to define the "equivalent residential unit" and how categories will be defined and individual properties assigned to the proper category. Another approach is to use a rate methodology which requires more readily available and (generally) more accurate data, such as gross property area and an assigned subjective parameter like "intensity of development" to reflect the property's demand on stormwater systems and programs.

In Griffin's case, the quality of the data in the City's utility billing file, the Spalding County property appraisal file, and other possible sources of information have not been fully assessed at this time. However, experience indicates that impervious area data can either be assembled or generated for non-residential properties relatively quickly and inexpensively in a small community like Griffin. The likelihood is that there are less than 2,000 non-residential properties that would be subject to a stormwater service charge based on impervious area, and suitable data may be available for estimating the amount of impervious coverage on many of these.

The ability of a data processing system to properly handle the generation, delivery, collection, and accounting of service charge billings depends on processing capability and storage capacity. The system must be capable of maintaining the necessary record history as well as processing bill periodically. Under an impervious area rate methodology, the vast majority of stormwater service

charge billings will be to developed properties that already have water or sewer service accounts so the number of additional "stormwater only" accounts will be limited. Although a detailed assessment of the existing utility billing system has not yet been completed, it appears to be capable of adding another line item for "stormwater management" and managing the associated data. Other options are to develop a stand-alone system or a separate account management file which generates a download billing file to the existing utility billing system.

The process of assembling a rate parameter database often provides unanticipated opportunities to enhance information for other applications or to gain additional data management capability. For example, the use of impervious area rate methodologies has been used by several cities and counties as a powerful justification for developing a geographical information system (GIS).

Impervious area is not a data parameter that is commonly collected for other purposes, but it is most readily identified and measured from aerial photographs. Aerial photography is also a necessary element for developing a GIS. In assembling a stormwater service charge database, it is imperative that the impervious area be associated with the correct property to ensure an accurate billing. A GIS is usually the most accurate approach to assembling and overlaying impervious area information with property delineations. Since many cities desire to have GIS capability for land use planning, infrastructure management, fire protection, and other purposes, its use for preparing a stormwater service charge database is sometimes justified when simple, less expensive options exist for that data alone.

The greatest problem related to this type of spin-off benefit is the time required to implement a GIS. Several months or even years may be needed to develop a fully configured GIS, whereas the data needed for a stormwater billing can be assembled independently in just a few weeks. The economic pressure of revenue foregone while a GIS is being developed is often enough to offset the long-term benefit of a GIS and has resulted in stormwater databases being developed in many cities without an associated GIS. Thoughtful planning may provide the lead time necessary to have a GIS in place ahead of time to support the data requirements of a stormwater utility.

Griffin does not presently have a GIS. The timing of stormwater utility implementation in this situation may preclude the opportunity of "piggy-backing" the development of a GIS on the stormwater utility. However, the data assembled for an impervious area (or other) methodology can be organized in a format that facilitates adding it to a GIS database in the future. It can also serve as the basis for integrating utility billing files, complaint response, and maintenance management systems with a geographical database through a GIS. At the very least, any new aerial photography undertaken to support a stormwater service charge should be of a standard that also supports development of a GIS.

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 8 BILLING AND COLLECTIONS

Introduction

The creation of a billing capability involves the development of two basic systems. First of all there is the development of a "master account file". This requires a combination of data, but the key information contained in the file are a complete set of addresses (one per parcel), an amount to bill each customer (or account), and a key field, which is often an account number. Secondly, there is the development or modification of the accounting, billing and mailing system.

The development of the master account file depends on the rate methodology chosen. In Griffin the preliminary decision has been made to bill on the basis of impervious area only without consideration for gross property area nor any other factor. A decision has also been made to bill single family homes on the basis of a flat rate, regardless of the size of the residence.

In terms of the accounting and billing delivery system, the existing utility billing system, (UBS) currently handles about 20,000 accounts, of which about 6,000 are actually outside the city limits. The City population is about 23,000 people, with an area of about 15.4 square miles. It is estimated that there are about 2,000 non-single family residential parcels, and about 10,000 single family residential parcels inside Griffin. According to the Finance Department, the current billing system (which handles water, sewer, solid waste, and electricity) has sufficient flexibility to handle a stormwater line item, but only if an additional module is purchased from the vendor. The system is an EDS/Infocell running on an HP 9000 mini computer (UNIX) with about 25 terminals and 7 gigabytes of memory. The City is currently planning to modernize the billing system to solve several problems, which include a year 2000 problem and shortcomings in the system's ability to produce the financial reporting required by law for electric utilities. It is unknown at this time if the billing system will be upgraded or replaced before stormwater billing begins. Given this, it is simply assumed at this time that any system in place will be made to function with a properly formatted master account file at the time that stormwater billing begins.

Development of the Master Account File

The rate for single family residential parcels (SFR's) will be determined in the rate study. These parcels must be identified, and this task can be accomplished by using the tax database. The tax database includes land use and account information that will allow SFR parcels to be individually identified.

All parcels which are not SFR, are, by default, non-single family residential (NSFR). These parcels are the ones for which impervious area must be measured in order to calculate stormwater bills. Impervious area which is accurate enough for the stormwater utility can only be obtained

through field measurement or aerial photography, because no other data source available in the City has good information on imperviousness. The tax database has some information on impervious features, but is known to be only 95% correct for building footprints and only 50% correct for paved surfaces. Since about 2,000 parcels are believed to be NSFR, field measurement will prove prohibitively expensive. Instead, it will be desirable to use aerial photography. Digital orthophotographed quarterquad maps are available to the City of Griffin at no charge through the State. Although these maps are about two years old, their low cost and resolution of one meter are sufficient reason to use them for the project. The impervious features on each NSFR parcel can be identified using these maps.

It is also necessary to accurately determine which impervious features fall on each individual NSFR parcel. The tax maps will be used for this purpose. By identifying the NSFR parcel numbers as described above, these parcels can be found on the tax maps and their boundaries can be used in determining which impervious feature falls on each NSFR parcel. It will not be necessary to identify SFR parcels or to identify impervious features on SFR parcels.

Because of the data intensive nature of measuring and calculating information for 2,000 parcels, and because the data sources are graphical, it will be desirable to use a GIS for the work. Given this, the NSFR parcels can be digitized into the GIS as polygons, using available visual cues from the aerial photos for grid registration. Once these polygons are inside the GIS, they can in turn be used to identify which impervious features fall on which NSFR parcel. The appropriate impervious features can then be digitized into the GIS, and using these and the parcel polygons, the impervious area for each NSFR parcel can be obtained. A GIS can also be used to perform calculations on the impervious area to determine the exact bill amounts for all NSFR parcels. Since the parcel line polygons for SFR parcels will not be digitized into the GIS, stormwater fees for these parcels cannot be maintained within the GIS. It is expected that the SFR fee data will be maintained in a relational database linked to the GIS.

It is important to note that, given this approach, exactly one stormwater bill will be computed (either within the GIS, or using the tax database) for each land parcel in Griffin. Of course, within the existing UBS for any given parcel, there may be zero, one, or more than one utility account in the UBS which is on any given land parcel. This difference must be accounted for before the stormwater master account file can be completed. Rectification of UBS accounts to stormwater parcels can be accomplished in the following way. For parcels with no UBS account where stormwater fees will be charged, a new record can be established in the UBS; these are often called "stormwater only" accounts. Necessary account fields can be obtained from the tax database record for the given parcel. For parcels with one UBS account where stormwater fees will be charged, the stormwater fees will be assessed to the existing UBS account. For parcels where more than one UBS account exists and stormwater fees will be charged, the problem is more difficult. This situation is not unusual; for example, many malls, shopping centers, condominium complexes, and industries have multiple water meters and accounts on one land parcel. The options for rectification include choosing one UBS account on the land parcel and applying all computed stormwater fees to that account, apportioning the stormwater fee equally among all UBS accounts on the land parcel, and other solutions. By a combination of the above

steps, and using tax database information on addresses and owners, eventually a one-to-one match of stormwater records in the master account file to utility records in the UBS can be attained.

Having attained a one-to-one match between UBS accounts and stormwater fee records means that all stormwater charges in Griffin are now assigned to a specific and correct UBS account and customer. The remaining steps necessary before billing can begin are:

- Update the impervious area information for NSFR parcels which have changed since the date of the aerial photography.
- Quality control of the data.
- Develop a process to continue to maintain the graphical and non-graphical data associated with stormwater billing.
- Establish the necessary customer service procedures for addressing complaints and disputes about the stormwater bills.
- Establish a link between the UBS, the GIS, and any other database used for housing the stormwater billing data.

The update of impervious area can be accomplished by review of building permits, sorted by date, for all NSFR parcels. Some field measurement may be required to verify the correct impervious area for these parcels. Additionally, it will be necessary to individually field check the largest stormwater accounts for accuracy because these are the accounts where errors could result in substantially incorrect bills. It is estimated that the largest 50 accounts is an adequate number to be double-checked. Additional quality control steps that should be taken include checking impervious area for NSFR accounts against the gross parcel area for the same accounts (very high impervious percentage indicates a possible error).

A process for maintaining the graphical and non-graphical stormwater data is imperative so that the data does not become outdated and inaccurate. In general, it is expected that building permits and land parcel changes are the two regularly-occurring events which signal a possible change in stormwater data. By revising the internal processes of the City of Griffin, and by working directly with the County tax office to track land parcel changes, the database will be maintained in a current state at all times.

Customer service for stormwater billing will be very similar to customer service for the existing utilities billed by Griffin, with one important distinction: the basis for the stormwater charge is much more difficult for customers to understand. Whereas, for electricity and water, meters are used, and for sewer a percentage of the water usage is used as the basis for a bill; for stormwater the basis is impervious area. This means that for NSFR customers with measured impervious area, provision of graphical evidence in support of the stormwater bill is desirable and necessary. By choosing to use a flat rate for SFR accounts, the City will have avoided this problem for the

majority of customers. The GIS can be set up to provide graphical output in support of NSFR stormwater bills.

Because it is not yet known what billing system the consultant will need to prepare a formatted database for, it has been taken as a given that the UBS as modified or replaced will receive properly formatted stormwater billing records. The exact method by which the UBS will communicate with the GIS and other databases must be established. This communication can be as simple as a monthly update file being read directly into the UBS by magnetic media. On the other end of the spectrum, more frequent updates via a network connection, or real-time updates are possible. The key issue in setting up the link process is that it should be simple and reliable. The consultant team will provide a database in a specified format for the city or billing system vendor to read into the system with provision of the proper accounting and database management modules.

Summary

A summary of the process recommended for establishing the master account file is provided below. The summary includes the estimated time schedule and cost for performing all necessary steps. No cost or time schedule estimate is provided for upgrading or replacing the existing UBS so that stormwater charges may be assessed through the system.

City of Griffin Master Account File Development

Major Process Step	Estimated Cost	Estimated Time Schedule in Months (1 2 3 4 5 6 7 8 9 10)
Categorize Parcels: SFR, NSFR	$3,000	
Digitize Parcel Lines	$15,000	
Digitize Impervious Features	$20,000	
Compute & Assign SFR Fees	$8,000	
Compute & Assign NSFR Fees	$15,000	
Match Parcels to UBS Records	$18,000	
Update NSFR Imperviousness	$18,000	
QC data	$10,000	
Develop Data Mgmt Process	$6,000	
Develop Customer Svc Process	$5,000	
Link UBS to GIS	$5,000	
Totals	**$123,000**	**9 Months**

CITY OF GRIFFIN
STORMWATER UTILITY FEASIBILITY ACTION PLAN

SECTION 9 PUBLIC RELATIONS OPTIONS

Introduction

Public awareness and education are carried out in stormwater management programs in two main ways: specific public awareness campaigns and ongoing "baseline" public information programs and activities. These two aspects differ in that a campaign has a beginning and an end while the ongoing program goes through transformations but does not envision an ending. This section discusses the campaign of public information for the development of the stormwater utility in Griffin. It was developed through discussions with City staff.

In order to develop a plan for the public information and education (PIE) plan we must first identify: (1) the phases of the project, (2) the "public", (3) the message(s) , and (4) different possible ways to reach the public (the medium).

Phases of the Project

The project is expected, in terms of public involvement, to have three main phases: buildup, billing day, and the post billing period.

The buildup is the period where the development and implementation of the utility begins. The buildup starts immediately and progresses to within a few weeks of the first bill going out. This period is one of gathering and disseminating data and information, identifying and meeting with different key public sectors, educating the press, and forming policy for the utility.

Billing day starts at about three weeks out from the first bill going out and lasts through the first month of the billing. It focuses on wide and effective coverage of the reasons for the billing, examples of the new effectiveness of the stormwater program and customer service responses to those who call in with inquiries and complaints.

The post billing period lasts from about a month after the first round of billing and then blends into a more long term PIE program to carry the stormwater program through its program growth stages.

Defining The "Public"

The first step in designing a PIE campaign is to ask the question: Who is the "public"? Who am I trying to reach and with what message? Who will have which specific concerns? Who is influenced by this or that aspect of the program? Different sectors or segments of the "public"

will generally participate or be interested in different issues and in different stages of the same issue:

- the development community will be vitally interested in regulatory and financial aspects;
- the environmental community will be vitally interested in water quality issues;
- specific neighborhoods will be interested in specific provisions for drainage controls, solving a specific flooding problem, regional storm water treatment, safety, park integration, greenways, etc.;
- landlords and major property owners will be interested in their own property-based costs and how to recover them easily;
- clubs or social organizations may be interested in participating in some programs;
- school children can be interested in the environment or clean creeks;
- social classes may be interested in utility fees or charges;
- tax exempt and governmental properties will be interested in new user fees;
- commercial and industrial concerns may have similar interests in fees and charges (and credits); and
- design professionals will have an interest in the technical criteria and regulatory requirements.

Twelve specific groupings of the public were identified in discussions with City staff:

- **Developers** - In Griffin developers tend to be independent and not represented by any specific group or organization. However, there are only a few developers in Griffin and they can be contacted individually concerning the utility.
- **Businesses** - Griffin has a relatively tight knit group of business owners. They gather at the Rotary and Kiwanas. They can also be represented by the Chamber of Commerce.
- **Industry** - While industry can be also represented by Kiwanas and Rotary it is better represented by the Industrial Authority.
- **Minorities** - Minority neighborhoods and individuals are not represented by any specific group. However, there are at least three commissioners who have been elected from primarily minority districts and, thus, can be expected to well represent their interests.
- **Schools** - The school board should be kept appraised of the impact of the utility on school property.
- **Churches** - There is probably a ministerial association or loose network of churches which can be contacted concerning the stormwater utility and its charges.
- **Homeowners** - The position of homeowners can be partially represented by the Reality Board. There are no overarching homeowners groups or more outstanding associations. Another approach would be to select specific homeowners, some of whom have been flooded, to meet and review the stormwater policies.
- **Landlords** - A large portion of the housing stock in the City of Griffin is held in the hands of landlords. This is partially due to the lack of apartment complexes in the area. Thus, they constitute a specific group. They can be represented by the Reality Board as well as individually by the major property owners.
- **City Commissioners** - The elected political leadership constitute a specific group of stakeholders - perhaps the most important group in terms of approval of the utility. The

Commissioners must be treated with special attention during the development of the utility and its policies.

- **City Staff** - Other City staff should be coordinated with in terms of the implications of the policies and data collection and development for their agencies and responsible areas. For example, the aerial photography can be used by several agencies in pursuit of their programs. Stormwater master planning can be integrated with parks, etc.
- **The "Top 100" Ratepayers** - There is a concern that the largest ratepayers be handled in a more personal way concerning their rate, credits, the program benefits and other questions that may arise. These will be identified specifically during the master account file development process, though many of them are known to the City staff now.
- **The Press** - The press can be a great ally in Griffin because they are generally supportive of City goals and programs. They need to be given clear and concise information in the appropriate format and to meet deadlines. They should be given notice of and access to important meetings and granted interviews when requested. White papers and other information is also helpful to insure they understand the concept and can portray it properly. The Appendix gives tips on dealing with the various media.

The table in the summary section includes a list of stakeholder categories and their key interests has been developed through discussions with City staff.

The Messages

What is it that makes a stormwater utility desirable in the first place? It provides a stable and adequate source of revenue to allow the City to fix and avoid flooding (and other) problems and it does so in a way that is more fair than by using property tax based methods.

The best way to "sell" a stormwater utility is to stress the benefits of the increased stormwater program... and to demonstrate those benefits in the first few weeks of the utility's life. Care should be taken not to try to sell a utility "because EPA is making us do it", "to get more money", "to be first", etc. It is also important not to raise expectations above what can be delivered. More money is NOT the solution if the program itself is not more effective. And, if there will be no property tax rebate, have a good explanation why.

So, in summary the messages should stress:

- there are needs in the community that are currently not being met;
- we have a plan to meet these needs that is well thought out, effective and not extravagant;
- this plan costs some more money, but this additional investment is well worth it;
- the method to generate this new revenue is fair, and is more fair than a tax increase;
- the method is not a tax but a user fee;
- the cost to each homeowner is minimal; and
- you will see results.

Specific program related messages concerning stormwater credits, a potential to save the cost of detention with new master plans and models, a more effective maintenance program, etc. can also be effective.

In terms of the phases of the project the messages should reflect what is happening or about to happen as:

- **Buildup** - The goal of the message during this phase of the project is one of educating and building support among the various stakeholder groups. Therefore the message highlights (dramatically if possible) the current problems experienced by members of the community, that all properties generate runoff, it stresses the benefits of the planned stormwater program, it introduces the concept of a more fair and stable way to pay for the program, and it gives basic information on rates and credits. Part of the goal is also to educate rate payers about the bill they will get to try to head off the multitude of questions and concerns. It may focus on specific rate payers to give them special attention to avoid pressures on the Commissioners from special interest groups or powerful individuals.
- **Billing Day** - The message goal here is to educate ratepayers on what the bill they just got is all about. It is fast response, often one-on-one, and consistent. There must be a phone line to call with people on the other end who can answer basic questions. There must also be technical personnel who can handle questions about credits and the bill amount. Another goal at this time, to help blunt any criticism, is to demonstrate that the program is active and effective. One way this is accomplished by having projects begin construction the day of first billing... and in advertizing that fact.
- **Post Billing Period** - The post billing period goal is to initiate a longer term public education and response program. There will be many policies made "on the fly" as a more effective capital program begins and people become more aware of the stormwater services. There should be consistent information on policies, a customer service bent to the responses, and satisfying answers to most questions. At this point a consistent way of making policies is as important as the policies themselves.

The Medium

How do different groupings of people get their information? Each type of medium has advantages and disadvantages. For example, a bill stuffer may get to each household but few people actually read them unless they are done VERY well. Some examples of various media might be:

- media kit and white paper
- media tour
- news releases and op-ed pieces
- feature stories on surface water problems
- B-roll footage for local news stations
- paid advertisement
- developed pamphlets
- free government informational and educational pamphlets

- slide-based or other video
- bill stuffers
- talk shows
- public access programming
- speaker's bureau availability
- political leader meetings
- one-on-one key person meetings
- booths
- special neighborhood or stakeholder meetings (such as Chamber of Commerce, etc.)
- information workshops
- customer service representatives
- hotline
- identity creation - logo, letterhead, vehicle markings
- phone survey research

The table below summarizes the results of a consideration of the phases of the campaign, the public groups and the media used to reach them. It is followed by a brief description of each medium and its message. The checked blocks indicates a primary target for this type of approach and capital "G" indicates that it will have general application to this group.

Summary Table

	Applicable Media Options										
	Presentations	**Informational Brochure**	**Fact Sheets**	**White Papers**	**News Articles**	**Radio Shows**	**Informational Meetings**	**Testimonials**	**Individual Meetings**	**Customer Service**	**Project Booklet**
Developers	✓	G	✓		G	G	✓	✓	✓		G
Businesses	✓	G	✓		G	G	✓			✓	G
Industry	✓	G	✓		G	G	✓			✓	G
Minorities		G			G	G		✓	✓	✓	✓
Schools		G			G	G			✓		G
Churches	✓	G	✓		G	G	✓	✓			G
Homeowners		✓			✓	✓		✓		✓	✓
Landlords	✓	G	✓		G	G	✓				G
City Commissioners	✓	G	✓		G	G	✓	✓	✓		✓
Press		G	✓	✓	✓	G	✓	✓	✓		✓
Top 100		G	✓		G	G	✓		✓		G
City Staff		G	✓		G	G			✓		G

Planned Schedule of Events and Activities

The tentative plan is for the first bill to be mailed in January, 1998. However, there will be a need for the commissioners to pass an ordinance to establish the enterprise fund well before that to allow for accrual of costs to the utility and not to the general fund.. This suggests an effort with the Commissioners which is informal and one-on-one to gage their support beginning in December. If sufficient support is available to pass an ordinance then the bulk of the effort will be invested in building and maintaining support for the utility among other stakeholders and the general public. It might be wise, if there is some resistance to the utility charge, to let the Commissioners know that they can pass an ordinance establishing the enterprise fund without ever setting up the utility funding method.

Specific Activities

Based on discussions with City staff a tentative list of high priority public awareness and education activities have been selected from the list described previously. The schedule below relates one alternative way these PIE items can be put together into a coherent program. The actual program will be developed later.

Activity	A	M	J	J	A	S	O	N	D	J	F
1. Develop Brochures/ Fact Sheets											
2. Free Govt. Information											
3. Bill Stuffers											
4. Information Workshops											
5. Identity Creation											
6. CIP Project Booklets											

Example descriptions of some of the more common public awareness items are discussed below. During development of the PIE plan those items selected by the City (as indicated in the table above) will be refined.

- **Presentations** - This is anticipated to be a fairly simple slide or overhead show with script which can be given by any of several staff or consultant personnel. We recommend that a computer screen presentation be developed with a computer projector. This will offer greater flexibility and allow for addition of slides and modification at the last minute. These slides can then also be simply printed for overhead applications. This may necessitate the insertion of digital photographs if such are used to illustrate flooding problems. Alternately a more generic slide show can be developed for use with alternate slides which can be inserted depending on the audience.
- **Informational Brochure(s)** - These brochures are designed to give a simple explanation of the utility, why it is necessary and what it will accomplish. It should be developed to answer the most common questions asked by a large number of people yet kept non-technical. There may be several which target different question types (for example one general one, one to answer questions on billing, one on how to get a complaint fixed, maintenance policies and responsibilities, etc.)

- **Fact Sheet** - This is a more technical but abbreviated way to leave behind information on specific topics (e.g. how to calculate your bill, what brought about the utility, what will the money be spent on etc.). They have usefulness to provide leave behind information for a target group (e.g. how will credits be calculated, impact on landlords, etc.).
- **White Papers** - A White paper is an in-depth discussion of topics of interest to the newspapers. They are designed to provide a packet of information which gives all necessary background to an article (or series of articles) which a paper may write. It can then serve as a reference document for the newspaper to check facts and get additional filler information to back up, for example, reporting on a public meeting.
- **News Articles** - This may be part of the white paper or another press packet. Some news organizations allow, and even appreciate, the City providing newsy pieces about the utility. They are not normally accounts of events but rather interesting stories about flooding, the utility method, etc.
- **Radio Shows** - There is a Friday morning talk show which has allowed the City to be part of in the past. This type of medium can be very effective if the staffer has coherent and short answers to the questions. See the appendix for tips on how to deal with press, be interviewed, etc.
- **Informational Meetings** - These meetings are designed to convey the information found in one or more fact sheets to a select or targeted group. The informational meeting is not as formal as a presentation, and allows for more give and take. This type of meeting can be effective if the speaker can give convincing reasons for the utility and demonstrate that the audience concerns have been fully considered. They can be less than effective if the speaker cannot give good answers to questions and cannot demonstrate understanding of and empathy for the audience concerns.
- **Testimonials** - Testimonials work well in conjunction with presentations and within news articles and white papers. They are effective when the speaker can be identified with by the audience, is honest and appropriately emotional, is articulate in the sense of giving their story clearly and cogently, and can demonstrate the value of the utility is fixing their particular flooding problem. The "articulate housewife" is the secret weapon when standing before a recalcitrant developer group, commission or other homeowner group.
- **Individual Meetings** - There are some individuals who, when convinced, carry an important weight of authority and influence. And when unconvinced they can obfuscate progress. The individual meetings should demonstrate a recognition of their position and influence, listen very carefully to their concerns, if possible solicit their support, and respond to questions which cannot be answered on the spot.
- **Customer Service** - The mailing of a stormwater bill will generate a lot of complaints and inquiries to the sender of the bill and to Public Works. Having a well conceived and responsive customer service capability which rapidly and effectively responds to these calls is, perhaps, one of the best public relations options available. There will be a number of complaints which can be handled relatively easily by a trained customer service representative (even a temporary position for a few months of billing). But many of the calls will need to be handled by Public Works personnel either due to the complexity of the call or the importance of the caller.
- **Project Booklets** - A list of planned capital improvements along with a projected schedule for construction has been used in the past by Griffin, and has proven to be very successful.

Such a booklet would also be helpful for this utility given the focus of the program on the construction of numerous smaller capital and remedial maintenance projects. But the booklet should be matched with a planned and prepared set of capital improvements which would be previously contracted and ready to construct the day the first bills go out. These projects should become media events so that the reporting in the media on the utility is one of progress in fixing long standing problems and not one of a new "rain tax".

Appendix 1
Tips on Dealing with the Media

Table 1 Media Tips - Television Interviews

- Listen to questions and remember then in detail.
- Smile when talking.
- Speak in 30 second clips.
- Be cordial... you don't need that kind of publicity.
- Give education and information in an entertaining way.
- Deliver a positive message about the subject.
- Give the information asked.
- Dress conservatively.
- You know more than anyone on this subject but brush up.
- Talk to a tenth grade education - no technical jargon.
- All microphones are always "on".

Table 2 Media Tips - News Conferences

- Remember that there is competition for the news media's attention and they often have several conferences to choose from.
- Make sure a news conference is more appropriate than an interview or press release.
- Pick a good central location familiar and accessible to the media.
- Choose a day early in the week and one without competing conferences.
- Avoid the rush by holding it early in the afternoon - say 1:30.
- Give notification in the form of a "media advisory" six working days prior to the conference.
- Address information to the "news planning desk" and include: Event, Time, Place, Speakers and Background.
- List your event in the local news calendar (termed the "daybook") one day prior.
- Provide footage for TV media. Have visuals in any case.
- Hire a photographer to photograph the event on film . . . black and white is fine.
- Prepare the room - remember to allow for sound hookups and camera platforms where necessary. Find the pay phones. Put up directional signs.
- Brief a spokesperson and prepare (see Table 3-7).
- Make up simple press kits: news release summarizing the conference; lists of names and titles of speakers; bio and photo of primary spokesperson; fact sheet on municipal program or campaign and the municipal department in charge; additional articles, brochures, etc.
- Offer phone interviews to no shows and send along press kits.

- Follow-up the day before.

Table 3 Media Tips - Interviews

- Be interviewed in a familiar setting.
- Anticipate touchy questions and have answers ready.
- If you cannot answer say so. State that the information is not for public disclosure and politely decline to answer.
- Stay cordial. Do not argue.
- Talk from the viewpoint of the public's interest.
- Talk in personal terms whenever possible.
- Allow time for the interviewer to meet his or her deadline.
- Know your topic thoroughly.
- Have printed support material on hand to give the interviewer.
- Set ground rules for the interview if possible.
- Build personal rapport prior to the interview.
- Avoid off-the-record remarks.
- Help the reporter make only one stop for all necessary information and follow-up interviews.
- Give the reporter the story they are after.
- Offer to get answers to questions unanswered and then get them to the reporter quickly.
- Do not ask when the story will run or how big it will be.
- State the most important fact at the beginning.
- Do not repeat a question or words in a question if it is offensive, even to deny them . . . they could be printed.
- Direct questions deserve direct answers.
- Tell the truth and do not exaggerate.
- Keep in touch on a continuing basis.
- Allow for the fact that the reporter knows little about storm water.
- Offer to help in the follow-up if necessary.

Attachment B
Stormwater Utility Manuals

Stormwater Utility Rate Structure Analysis

CITY OF GRIFFIN
STORMWATER UTILITY

RATE STRUCTURE ANALYSIS - EXECUTIVE SUMMARY

Purpose

This ***Executive Summary*** presents a concise report highlighting the findings and recommendations of the stormwater utility ***Rate Structure Analysis*** prepared for the City of Griffin, Georgia.

Summary of Conclusions and Recommendations

The City must deal with a legacy of many years of insufficient investment in stormwater system improvements and operations. Stormwater management is becoming an increasingly complex activity. Stormwater quantity problems such as localized erosion and flooding capture the most public attention today, but water quality management will become an additional facet of the local drainage program. It is not possible to accomplish everything that needs to be done with a few months or even a few years. A "building block" approach will be needed develop and implement an effective program in Griffin over several years.

An impervious area service charge rate methodology is recommended, under which properties would be charged based on the amount of rooftop, parking area, walks, and other surfaces which impede or prevent stormwater infiltration into the soil and thus cause increased runoff.

Rate modifying factors should be used to enhance funding equity and reduce the expense of implementing and maintaining a service charge master account file. A full range of modifying factors were considered. Two are recommended at the outset of the program, a simplified residential charge and credits for mitigative systems and activities provided by property owners.

Nearly a dozen secondary funding methods were considered, but few are suitable for the stormwater utility program in Griffin initially. Plan review, inspection, and other special fees could be incorporated directly in the initial stormwater rate methodology and rate ordinance. A combination of bonding and pay-as-you-go funding should be used to pay for capital improvements. As a general rule, use of bonding should be restricted to those capital costs which cannot be satisfied through annual budget appropriations. Typical bonded costs include large tracts of land, project right-of-way and easement acquisition, and the more costly construction projects. Small construction projects, equipment and other short-lived, inexpensive capital assets should be budgeted annually and paid for from cash flow (pay-as-you-go).

The recently approved Special Local Option Sales Tax (SPLOST) provides a source of capital funding for stormwater (and other) projects for up to five years beginning in 1997. However, the

funding available for stormwater projects from SPLOST is not sufficient to address even a small percentage of the total needs. A few of the currently identified projects can be paid for using SPLOST funds, but long-term needs will require additional funding. SPLOST does not offer a means of funding long-term bonds. Additional sources of funding for capital projects will be needed, and utility service charges call fill this role.

Analysis of Service Charge Rate Methodologies and Other Funding Sources

Types of Funding

A "menu" of stormwater rate methodologies, modifying factors, and other funding methods is examined in this report. Five basic rate methodologies, seven modifying factors, and ten secondary funding methods were initially examined. The rate methodologies are the foundation of the utility funding approach. Modifying factors and secondary funding methods amend or supplement the basic rate methodology. In this case several modifying factors and secondary funding methods were rejected during the initial screening.

Once a preferred rate methodology concept is selected by the City Commission, a more detailed ***Cost of Service Analysis/Rate Study*** will be prepared. It will examine the specific service charge rate methodology in detail and address the use of modifying factors or other funding mechanisms with the service charge.

Rate Methodologies and Funding Methods Considered

The five rate methodologies summarized in this report are based on:

- impervious area;
- gross area and the intensity of development;
- impervious area and gross area;
- impervious area and the percentage of impervious coverage; and
- gross area, with several adjustment factors.

A full range of modifying factors was initially examined which might be applied to a basic rate methodology. Only two were judged to be consistent with the City's initial program needs:

- a simplified or flat-rate charge for single-family residential properties;
- credits for mitigative measures such as on-site detention systems;

Other funding methods that could be used in coordination with stormwater service charges (as possibly modified by various factors) were considered. Five fit with the strategy and could be integrated with the service charge rate concepts identified. Others were carefully considered but rejected as inappropriate at this time. The following secondary funding methods were judged to be practical for the program, although some may not be needed or appropriate in the first few years of the utility approach.

- plan review, construction inspection, and on-site system inspection fees;
- special service charges for enhanced levels of service;
- system development charges;
- Special Local Option Sales Tax (SPLOST) revenues for capital projects; and;
- bonding (major capital projects) and pay-as-you-go funding (smaller projects).

Revenue Requirements

Table 1 on the following page summarizes the preliminary estimated cost of service that the service charge rate methodology and secondary funding methods will have to support during the next five years.

Table 1

Preliminary Stormwater Program Cost of Service
(1997 dollars)

#	Program Element	1997	1998	1999	2000	2001	2002	On-going
EXISTING PROGRAM								
1	Administration	50	50	50	50	50	50	50
2	Operations & Maintenance	400	400	400	400	400	400	400
3	Capital Improvements	100	100	100	100	100	100	100
PLANNED PROGRAM								
4	Billing and Indirect cost		60	60	60	60	60	60
5	Rate Study			25			25	
6	Add two personnel		90	90	90	90	90	90
7	Add one Crew for O & M - Equipment		180					
8	- Operations (mid-yr.)		85	170	170	170	170	170
9	Add one Crew for O & M - Equipment				180			
10	- Operations (mid-yr.)				85	170	170	170
11	Fly City, Ortho photos, digital mapping	**50**[1]		**100**	100			
12	Establish Basic GIS Capability	**25**	**25**					
13	Inventory System		**50**	**50**	**50**			
14	Develop GIS Applications			50				
15	Stormwater Master Planning ($450,000 total)[2]			50	100	100	100	
16	SPLOST Capital Construction Program	**150**	**200**	**100**	**200**			
17	Extended Capital Construction Program					200	200	200
18	**TOTALS**	775	1240	1245	1635	1340	1365	1240

[1] Note - **bold** totals are expected to paid from SPLOST funds
[2] Master planning continues for another year only and is not ongoing after that.

Analysis of Service Charge Rate Structures

Impervious Area

Stormwater rate structures employing impervious area as the sole parameter have been widely used for nearly twenty years. They are simple, easy to understand, and the data is often relatively inexpensive to assemble or create. Table 2, below, summarizes the evaluation of this rate methodology.

Table 2 Impervious Area Rate Methodology	
Equity.	Good to excellent depending on the accuracy of impervious data that is available. Relationship to problems and costs is easily understood by the general public.
Balance of rates with the level of service.	Good, but limited by the precision of the information available on the cost of stormwater services and facilities, especially at the outset of the program.
Data requirements.	Moderate to high, depending on the availability of accurate data from other sources.
Cost of implementation and upkeep.	Low to moderate depending on the availability of data on impervious area and complexity of modifying factors used.
Compatibility with data processing systems.	Acceptable, although the utility billing system currently in use poses some constraints for all rate methodologies.
Consistency with other financing and rate policies.	Good to very good.
Revenue sufficiency.	Likely to be adequate for the initial program within an assumed willingness to pay of $ 2 to $ 4 per month for single-family residential.
Revenue stability and sensitivity.	Very stable. Measures by property owners to reduce service charges by retrofitting on-site systems are not usually economically efficient.
Flexibility.	Minimal flexibility, except through use of modifying factors.

Gross Area and Intensity of Development

A rate structure based on the gross area of each property and its intensity of development usually results in a distribution of the costs of service somewhat different from that achieved through an impervious area methodology. The differences are most apparent when undeveloped as well as developed properties are charged for stormwater management by assigning an intensity of development classification to properties which have no impervious coverage. Undeveloped land is by definition omitted from an impervious area rate base. Table 3 summarizes the evaluation of this rate methodology.

Table 3 Gross Area and Intensity of Development Rate Methodology	
Equity.	Fair to good, depending on the degree of refinement that is available in the menu of intensity of development factors used in the service charge calculation.
Balance of rates with the level of service.	Good, but limited by the precision of the information available on the cost of services and facilities, especially at the outset of the stormwater program.
Data requirements.	Gross area only. Intensity of development is subjective assignment.
Cost of implementation and upkeep.	Typically less costly than other options because data requirements are less exacting.
Compatibility with data processing systems.	Acceptable, although the utility billing system poses some constraints for all rate methodologies.
Consistency with other financing and rate policies.	Fair. Less precision than typically expected in other utility rate methodologies.
Revenue sufficiency.	Good to very good, depending on the intensity of development factors used and whether the charge is applied to agricultural and other undeveloped properties.
Revenue stability and sensitivity.	Very stable. Measures by property owners to reduce service charges by retrofitting on-site systems are not usually economically efficient.
Flexibility.	Good. Subjective intensity of development factors allow easy adjustments without the need to gather specific data.

Impervious Area and Gross Area

This specific rate methodology has not yet been used by other jurisdictions, although several have considered it and the City of Philadelphia will soon begin implementing such a rate structure. This approach offers an effective means of including the two primary parameters which influence stormwater runoff quantity and quality (gross area and impervious area) in the service charge calculation. It is similar to the rate methodologies employed by the City of Denver, Colorado and others which use both gross and impervious area information to derive percentages of imperviousness, ratios, or other figures which are then used in rate calculations. As defined for this analysis, the impervious area/gross area approach could generate service charges for undeveloped as well as developed lands. Table 4, below, summarizes the evaluation of this option.

Table 4 Impervious Area and Gross Area Rate Methodology	
Equity.	Very good. Easy to explain to the general public.
Balance of rates with the level of service.	Good, but limited by the precision of the information available on the cost of stormwater services and facilities, especially at the outset of the program.
Data requirements.	Two parameters cause the data requirement to be higher than for options based on one parameter.
Cost of implementation and upkeep.	Higher than for single parameter options.
Compatibility with data processing systems.	Acceptable, although the utility billing system poses some constraints for all rate methodologies.
Consistency with other financing and rate policies.	Good to very good, depending on the formula for weighing the two parameters.
Revenue sufficiency.	Excellent. Potentially higher revenues might be generated than under other rate structure options.
Revenue stability and sensitivity.	Very stable. Measures by property owners to reduce service charges by retrofitting on-site systems are not usually economically efficient.
Flexibility.	Very good, although both parameters are measurable which reduces engineering judgment somewhat.

Impervious Area and Percentage of Impervious Coverage

This type of rate methodology has been used by the City of Denver and a few other jurisdictions. Both gross and impervious area information are used to derive percentages of imperviousness, ratios, or other figures which are then used in rate calculations. As in the case of rate structures based directly on gross area and impervious area, the expense of developing the database may be higher given the need for data on two primary parameters (gross area and impervious area). Table 5 summarizes the evaluation of this option.

As defined for this analysis, the impervious area/impervious percentage approach would generate service charges only for developed lands, and thus differs from the impervious area/gross area approach described above which would generate charges for both developed and undeveloped lands. It would likely be more popular among agricultural interests and other owners of large undeveloped tracts.

Table 5 Impervious Area and Impervious Percentage Rate Methodology	
Equity.	Very good, and fairly easy to explain to the general public.
Balance of rates with the level of service.	Good, but limited by the precision of the information available on both gross and impervious areas and the cost of services and facilities, especially at the outset of the program.
Data requirements.	Two parameters cause the data requirement to be higher than for options based on one parameter.
Cost of implementation and upkeep.	Higher than for single parameter options.
Compatibility with data processing systems.	Acceptable, although the utility billing system poses some constraints for all rate methodologies.
Consistency with other financing and rate policies.	Good to very good, depending on the formula for weighing of impervious area versus percentage of imperviousness.
Revenue sufficiency.	Comparable to rates based on impervious area and gross area/intensity of development.
Revenue stability and sensitivity.	Very stable. Measures by property owners to reduce service charges by removing impervious area are unlikely and retrofitting on-site systems is not usually economically efficient.
Flexibility.	Very good. Impervious area is precisely measurable, but engineering judgment can be introduced in the formula for weighing impervious area versus impervious percentage in the calculation of service charges for each property.

Gross Area and Modifying Factors

Although this rate methodology is not used elsewhere it is worthy of consideration because of the degree of change required of the stormwater program in the next few years. The basic determinant of service charges to individual properties would be gross area. One or more modifying factors could serve the same purpose as an intensity of development factor, providing the flexibility to account for minor differences among generally comparable properties. A similar methodology could be designed using impervious area as the basis of the methodology rather than gross area, but it would implicitly exclude undeveloped properties whereas this option would allow calculation of service charges for undeveloped as well developed properties. While this rate concept is a desirable extension of the current state of the art, it is neither realistic nor justifiable today in Griffin. Table 6 summarizes the evaluation of this rate methodology.

Table 6

Gross Area and Modifying Factors Rate Methodology	
Equity.	Potentially excellent but very difficult to validate and communicate to the general public.
Balance of rates with the level of service.	Could create service charges closely balanced to the cost of service but much more data on costs would be needed.
Data requirements.	Much greater data requirements than other options.
Cost of implementation and upkeep.	Potentially much more costly to implement and maintain than other options, depending on the number and type of parameters considered.
Compatibility with data processing systems.	Could create greater problems in terms of data assembly, data processing, and file storage.
Consistency with other financing and rate policies.	Exceeds the precision of other types of utility rate methodologies and the normal legal/technical standards applied by the courts. However, the precision may be an illusion rather than reality.
Revenue sufficiency.	Potentially as high or higher than other options because it can account for various impacts on peak flow, total volume, and pollutant loading, plus allows undeveloped properties to be charged.
Revenue stability and sensitivity.	Very stable. Measures by property owners to reduce service charges by retrofitting on-site systems are not usually economically efficient.
Flexibility.	Highly flexible both in terms of applications to specific properties and ability to keep pace with changes in the program over time.

Analysis of Modifying Factors

The purpose of modifying factors is not to simply generate revenue, but rather to improve the overall equity of the stormwater funding strategy and/or to reduce the cost of developing and maintaining a service charge master account file and billing systems.

Simplified Single-family Residential Service Charge

The vast majority of cities and counties which have stormwater service charges employ a simplified charge of some sort for single-family residences. Some use just one flat-rate charge while others have two or more categories. Table 7 summarizes the evaluation of simplified residential service charges.

Table 7 Simplified Residential Service Charge	
Equity.	Adequate for technical/legal standards. A single flat-rate charge may be perceived by ratepayers as regressive and unfair to owners of small homes on small lots.
Balance of rates with the level of service.	Adequate. Limited by the precision of information available on the cost of services and facilities, especially at the outset of the stormwater management program.
Data requirements.	Significantly reduces data requirements for master account file.
Cost of implementation and upkeep.	Significantly reduces cost of initial implementation and upkeep of the master account file.
Compatibility with data processing systems.	Fully compatible with existing systems and information currently in files.
Consistency with other financing and rate policies.	Generally consistent with utility rate practices for water and wastewater which widely use minimum charges.
Revenue sufficiency.	Reduces revenue slightly.
Revenue stability and sensitivity.	Does not impact revenue stability or sensitivity.
Flexibility.	Allows use of single flat-rate charge, tiers of residential charges, or basic residential charge plus additions for larger impervious or gross lot area.

Credits for Mitigative Measures

Perhaps the most widely-practiced modification to basic stormwater management rate methodologies is the application of a credit adjustment for properties which provide on-site controls that reduce their impact on the stormwater runoff and pollution. On-site stormwater detention and retention systems can reduce the peak rate of stormwater runoff and best management practices (BMP) can reduce pollutant loadings discharged to receiving waters. Service charge credits for on-site systems and management practices which mitigate impacts on the public systems may encourage owners to install more effective systems in the future. Table 8 summarizes the evaluation of credits for mitigative measures.

Table 8 Credits for Mitigative Measures	
Equity.	Enhances equity by recognizing on-site controls which mitigate impacts on the public stormwater systems.
Balance of rates with the level of service.	Improves the balance of rates with actual level of service required by properties having on-site controls.
Data requirements.	More data is required about the design and operating condition of on-site facilities.
Cost of implementation and upkeep.	Adds cost for an initial assessment of the systems and periodic inspections to verify condition. Some or all of these costs could be passed on to the ratepayers involved.
Compatibility with data processing systems.	Would require development and maintenance of a data file on on-site systems.
Consistency with other financing and rate policies.	Consistent with the basic philosophy that stormwater service charges should be consistent with each property's impacts on the public stormwater systems.
Revenue sufficiency.	Would reduce revenue stream slightly.
Revenue stability and sensitivity.	Assuming that on-site facilities would be maintained, the impact on revenue would be relatively consistent. The economics of credits for on-site controls does not make the rate methodology significantly more sensitive to ratepayers' measures to reduce their charges.
Flexibility.	Highly flexible and able to accommodate local policies.

Analysis of Secondary Funding Methods

Plan Review, Inspection, and Other Special Fees

One of the most important stormwater management functions will be regulation of the development and use of private property to reduce or eliminate impacts on the public drainage systems. Private developments impact stormwater systems both directly and indirectly. Plan review of proposed developments to ascertain their impact on the City's stormwater systems and programs and inspections will be needed to verify compliance with both initial construction and on-going operational standards. Plan review and inspection fees can be established under the City's basic authority to design rates to recover costs of service. Table 9 summarizes the evaluation of plan review and inspection fees.

Table 9 Plan Review, Inspection, and Other Special Fees	
Equity.	Enhances equity by placing the cost of plan review, inspection, and other services on those requiring them.
Balance of rates with the level of service.	Results in a marginally better balance of rates with level of service by placing costs directly on those receiving services.
Data requirements.	Could range from minimal to extensive depending on how the fees are structured.
Cost of implementation and upkeep.	Might range from minimal to moderate, depending of the type of fee structure adopted.
Compatibility with data processing systems.	A simple schedule of fees would have little if any impact. A more refined "draw account" method could require development of new computer programming.
Consistency with other financing and rate policies.	Generally consistent with placing costs on those requiring the services.
Revenue sufficiency.	Plan review and inspection fees rarely recover the full cost of the service.
Revenue stability and sensitivity.	Relatively unstable because of direct relationship to the pace of development. Revenue is very sensitive to developers decisions whether to proceed with projects.
Flexibility.	Highly flexible. Fees could vary from a simple schedule to a complex draw account approach.

Special Service Charges for Enhanced Levels of Service

Special service charges for enhanced levels of service would enable the city to employ a basic service level throughout a service area yet also respond to differing customer expectations and isolate additional expenses to those requesting higher levels of service than the norm. They have evolved from the stormwater utility service charge funding concepts in response to the diverse demands placed on the systems and ratepayers' broadly varying willingness and ability to pay. Table 10 summarizes the findings regarding special service charges.

Table 10

Special Service Charges	
Equity.	Special service charges distribute costs only among properties determined to be serviced by a project or activity.
Balance of rates with the level of service.	Special charges are typically associated with an enhanced level of service. They do not have to adhere to the more demanding standards applied to special assessments, which must be related to the direct and special benefit of projects which accrues to individual properties.
Data requirements.	The data requirements of special service charges are dictated by the parameters employed in determining the amount to be billed to each property.
Cost of implementation and upkeep.	The cost of implementation in normally very low because special charges are usually based on information available from other sources or easily attainable. In most cases there are no upkeep expenses associated with special service charges.
Compatibility with data processing systems.	Not likely to require extensive data processing support.
Consistency with other financing and rate policies.	Consistent with the objective of placing on costs of facilities on those using them.
Revenue sufficiency.	Adds to long-term revenue stream, typically providing revenue for special improvements or increased levels of service above the norm.
Revenue stability and sensitivity.	Not stable because revenues are dependent on erratic public demand for special service charge areas for special purposes.
Flexibility.	Relatively flexible. Can be designed to meet specific capital improvement and operating program funding needs.

System Development Charges

The basic purpose of a system development charge is to equalize the financial participation in capital investments among ratepayers served by systems at different points in time. Similar but more complex funding methods known as capital facility fees, plant investment fees, connection fees, and capital recovery fees are widely used for water and wastewater and by private utilities. However, they have not been widely used to date for stormwater management. Table 11 summarizes the evaluation of system development charges.

Table 11

System Development Charges	
Equity.	Improves equity under an impervious area rate methodology by allocating a portion of capital costs among properties which are developed after facilities sized for future development are built. Not needed under a gross area methodology that includes billing of undeveloped properties
Balance of rates with the level of service.	Properly reflects the level of service provided to properties as a result of designing to accommodate future development.
Data requirements.	Moderate data requirements could necessitate development of a simple computer program to track capital costs.
Cost of implementation and upkeep.	Moderate to high depending on the structure of the system development charge and data on capital costs.
Compatibility with data processing systems.	Likely to be based on a separate database to determine charges, which might be added to the normal service charge or billed separately.
Consistency with other financing and rate policies.	Highly consistent with the objective of placing on costs of facilities on those using them.
Revenue sufficiency.	Adds to long-term revenue stream, especially once major capital improvements begin.
Revenue stability and sensitivity.	Not stable because revenues are dependent on the pace of development.
Flexibility.	Highly flexible. Can be designed to meet capital funding requirements that change annually and reflects long-term accumulated capital cost. Also can account for depreciation of assets.

Special Local Option Sales Tax (SPLOST) Funding of Capital Improvements

In 1996 Spalding County voters approved a Special Local Option Sales Tax (SPLOST) to fund a variety of capital improvements, including stormwater management. The County allocates a portion of the tax receipts to the City to use for funding improvements. Specific projects were not identified in the ballot issue. The City's use of these tax revenues is therefore limited primarily by the underlying restrictions on the use of this source of funds, most notably that they must be used only for capital improvements. Table 12, below, summarizes the analysis of using the SPLOST revenues for stormwater capital funding.

Table 12 Special Local Option Sales Tax (SPLOST) Funding of Capital Improvements	
Equity.	SPLOST funding can be combined with bonding and annual appropriations to fund stormwater capital projects, increasing total investment capacity.
Balance of rates with the level of service.	SPLOST revenues are not related to the level of stormwater service provided, but are an accepted funding method which requires ballot approval.
Data requirements.	There are no data requirements associated with SPLOST funding because the sales tax is collected anyway.
Cost of implementation and upkeep.	There is additional cost associated with implementation and upkeep of SPLOST.
Compatibility with data processing systems.	SPLOST funding requires no data processing systems because the sales tax is already collected and processed. The rate of the sales tax simply changes.
Consistency with other financing and rate policies.	Highly consistent with the City's practices for funding capital investment in other utilities, which also receive funding from SPLOST revenues.
Revenue sufficiency.	There are numerous competing demands for SPLOST revenues. It may be unrealistic to expect that a large portion of SPLOST revenues can be allocated to stormwater management projects.
Revenue stability and sensitivity.	SPLOST funding for capital projects or acquisitions is limited by the level of sales in the city and is influenced by economic conditions.
Flexibility.	SPLOST can be used for a full range of capital needs.

Bonding and Pay-as-you-go Funding for Capital Improvements

Capital investment in stormwater management will include acquisition of major expenditures for land, rights-of-way and easements, and expensive pieces of equipment as well as large and small construction projects. Table 13 summarizes the evaluation of these options.

Table 13 Bonding and Pay-as-you-go Capital Expense Funding	
Equity.	Bonding and pay-as-you-go funding can be combined to result in an equitable distribution of capital costs over time.
Balance of rates with the level of service.	Bonding can be used to distribute costs over time, enabling the cost of long-lived assets to be shared by more of the ratepayers served by the facility.
Data requirements.	Data requirements directly associated with bonding or pay-as-you-go funding are minimal.
Cost of implementation and upkeep.	The cost of implementing bonding or pay-as-you-go funding for capital costs is minimal. Bonding incurs a long-term expense in the form of interest, but allows projects to be expedited and future risks to be thereby avoided.
Compatibility with data processing systems.	Capital funding methods pose no direct impact on data processing systems. Indirect impacts may occur in association with bonding (e.g., data needed for system development charges).
Consistency with other financing and rate policies.	Highly consistent with City practices for other infrastructure funding such as water and wastewater, which has relied on both bonding and pay-as-you-go funding for capital expense needs.
Revenue sufficiency.	Pay-as-you-go funding of capital costs can erode funding for operating expense. Bonding provides a specific amount of funding for capital projects, which may be a problem if cost overruns occur or opportunities to expand projects emerge.
Revenue stability and sensitivity.	Bonding provides a fixed amount of funding for projects or acquisitions. Pay-as-you-go funding, being a part of the annual budget process, is highly sensitive and not a stable source of funding for multi-year projects.
Flexibility.	Both bonding and pay-as-you-go funding can be used for a full range of capital needs.

Attachment B
Stormwater Utility Manuals

Stormwater Utility Service Charge Credit
Technical Manual

CITY OF GRIFFIN

GEORGIA

STORM WATER UTILITY

STORMWATER UTILITY SERVICE CHARGE CREDIT TECHNICAL MANUAL

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CITY OF GRIFFIN
STORMWATER UTILITY SERVICE CHARGE
CREDIT TECHNICAL MANUAL

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SECTION I. OVERVIEW AND GENERAL INSTRUCTIONS

A stormwater credit is a reduction in your stormwater service fee if you build and maintain a stormwater detention or retention pond in a way to reduce the impact of stormwater runoff from your property. A credit of up to 50% of the total stormwater fee may be available to you for a well designed and maintained detention/retention facility.

DEFINITIONS

- ***Credit*** means a reduction in a customer's stormwater service fee given for certain qualifying activities which reduce the impact of increased stormwater runoff.
- ***Detention Facility*** means a facility, by means of a single control point, which provides temporary storage of stormwater runoff in ponds, parking lots, depressed areas, rooftops, buried underground vaults or tanks, etc., for future release, and is used to delay and attenuate peak flow.
- ***Retention Facility*** means a facility which provides storage of stormwater runoff and is designed to eliminate subsequent surface discharges.
- ***Routing*** means an engineering technique described as computation of the movement and attenuation of an inflow hydrograph as it passes through the stormwater system, resulting in a discharge hydrograph at the downstream end of the element such as a pipe, channel, or detention basin, and accounts mathematically for the effects of storage on flow through the element. "Level pool routing" assumes that a retention/detention facility maintains an "even" or "level" surface water elevation.
- ***Stormwater*** means stormwater runoff, snow melt runoff, and surface runoff and drainage.

GENERAL POLICIES

- Credit is given to eligible non-single family residential properties only. A homeowners association may apply for a credit for their detention/retention pond which serves their neighborhood.
- A Right-of-Entry or easement, as applicable, must be given to the City in order for a credit to be approved.
- Credit applications for existing facilities may be submitted at any time. However, the credit will be applied retroactively to the first month of stormwater billing **only** for those credit applications received within one year from the end of the month of the first stormwater billing. After that time it will be applied in the next month after the credit has been approved.
- Credit applications for new construction may be submitted once the facility is in place and stormwater billing begins whichever is later.

BASIC PROCEDURES

Some engineering calculations are required to receive credit. Therefore, certain parts of the application are required to be performed by a registered professional engineer. The basic procedure is to pick up an application packet; perform the necessary analysis; fill out the application and submit required information. The credit will be instituted by the City after approval of an application.

SECTION II -- CREDIT POLICIES AND PROCEDURES

The purpose of this section is to give the procedures of applying for and receiving a credit. It contains step by step procedures.

SPECIFIC POLICIES

1. All properties, other than single family residential properties, which have constructed stormwater retention or detention facilities and maintain them in accordance with City defined standards (below) may be eligible for a percentage reduction, or credit, in that property's stormwater service fee. The credit shall only be applied to that portion of the property served by the detention basin.

2. To receive any credit towards their storm water service fee, the property owner must insure that: (1) such facility meets design, construction and maintenance standards in effect at the time of construction; (2) a complete Credit Application Form sealed by a professional engineer licensed to practice in Georgia has been submitted; (3) there has been provided to the City a signed Right-of-Entry by the owner thereof. See the attached forms in the Appendix.

3. If all requirements and conditions of this section are met, the credit will be available upon successful completion of an application process and successful completion of a City inspection. The credit shall remain in force as long as the facility is maintained in satisfactory condition. The following section describes required maintenance of detention/retention facilities.

4. The Rational Method may be used for detention/retention basins draining five (5) acres or less. The SCS method may be used in all cases. For the pre-development condition peak rate calculation a Rational Method C factor of 0.20 or an SCS Method curve number of 63 shall be used. The same method must be used for both pre- and post-development flow calculations.

MAINTENANCE STANDARDS

In order for stormwater retention and detention facilities to operate as they were intended, maintenance must be routinely performed. Improperly maintained stormwater retention and detention facilities do not reduce stormwater impacts effectively. The following items are the basic minimum maintenance requirements for all stormwater facilities:

1. Sediment shall be removed when about 20% of storage volume of the facility is filled.
2. Sediment traps, if existing, shall be cleaned out when filled.
3. No woody vegetation shall be allowed to grow on the embankment without special design provisions.
4. Other vegetation shall be cut when it exceeds 18 inches in height unless part of managed landscaping.
5. Debris shall be removed from blocking inlet and outlet structures and from areas of potential clogging. This is especially important after major storms. Extended detention control devices should be checked often for debris accumulation and/or clogging.

6. The control structures shall be kept structurally sound, free from erosion, and functioning as designed.
7. No standing water is allowed within detention basins.

AMOUNT OF CREDIT

The overall goal of City is to give a credit to property owners that are reducing the impact of stormwater generated by their property. By reducing the peak discharge of stormwater from their property, property owners are helping the City protect properties downstream.

Credits for retention/detention facilities are available after having first satisfied the maintenance requirements previously mentioned. Credits up to a maximum amount of 50% are available under the following conditions:

- A minimum of a 20% credit is available to owners that can demonstrate that the peak stormwater discharge rate for the 10-year storm from their stormwater retention/detention facility on a post developed site (Q_{post}) is no more than 10% **greater** than the peak stormwater discharge rate before development (Q_{pre});

- A 30% credit is available to owners that can demonstrate that the peak stormwater discharge rate from their stormwater retention/detention facility on a post developed site (Q_{post}) is **equal** to the peak stormwater discharge rate before development (Q_{pre});

- A maximum or 50% credit is available to owners that can demonstrate that the peak stormwater discharge rate from their stormwater retention/detention facility on a post developed site (Q_{post}) is 20% **less** than the peak stormwater discharge rate before development (Q_{pre}).

- There is a straight line interpolation between these 3 conditions.

The figure on the next page illustrates the outlined crediting program for stormwater service fees for the City of Griffin.

Based on the figure, a percent credit can be calculated from the following equation:

$$P = (1.3 - (Q_{post} / Q_{pre})) * 100$$

Where : **P** is the percent reduction in stormwater service fee to be applied to the property.
Q_{pre} is the pre-development peak discharge rate using either the Rational Method or the SCS Method.
Q_{post} is the post development peak discharge rate determined by calculating the routed peak discharge rate exiting the retention/detention facility for a 10-year storm. The same method for flow calculation as for pre-development conditions must be used.

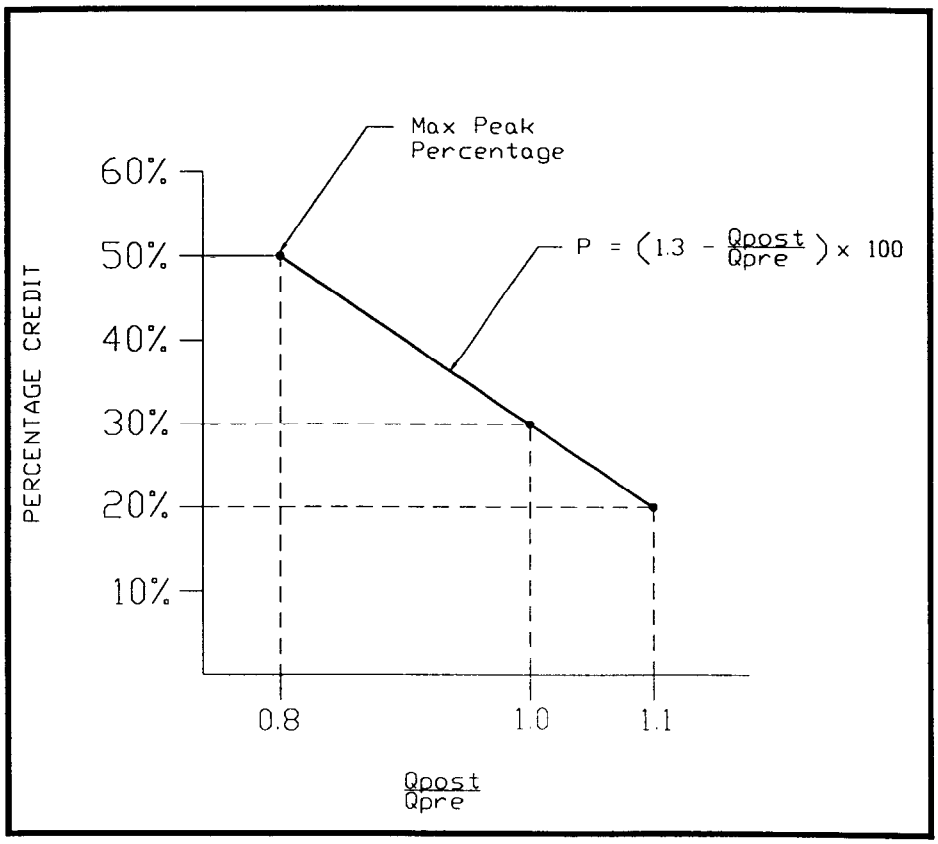

Figure 1 - Credit Calculation Line

The flows can be calculated using either the Rational Method (for drainage areas to the pond in aggregate of less than 5 acres) or the SCS unit hydrograph method.

If the Rational Method is used the pre-development C factor will be 0.20. Then the peak is calculated as:

$$Q_{pre} = C\, I_{10yr}\, A$$
$$Q_{pre} = .20\, I_{10yr}\, A$$

Where: **C** is the Runoff Coefficient
I is the 10-year rainfall intensity (in/hr) for the calculated time-of-concentration
A is the drainage area, acres

SCS standard unit hydrograph methodologies can be used for all calculations when determining the pre- and post-development peak flows. They **must** be used for drainage areas in aggregate to the facility of 5 acres or more. The storm must be for the 10-year event and at

least 6-hours in duration. The SCS 24-hour storm can be used as is found in many standard commercial detention design applications.

PROCEDURES

STEP 1: The property owner or representative obtains a credit application packet from the City.

STEP 2: The owner insures the retention/detention facility is properly maintained and functioning as designed.

STEP 3: A professional engineer measures the basic retention/detention facility features and calculates Q_{post} and Q_{pre}.

STEP 4: The completed application, including the calculations sealed by the professional engineer and the signed Right-of-Entry form, is submitted to the City.

After the completed application is received, the City will pull the site plan (if available) and provide it and a checklist to an inspector. The inspector will check the retention/detention facility area to insure it meets minimum design and maintenance requirements. The City will then instate the credit on the next month's fee. If the facility is pre-existing, and the application is made within one year from the end of the month the first bill is sent, the credit will be given retroactively to the date of the first billing or the date the facility was first put in place, which ever is shorter.

If the facility fails the inspection, the City will provide a letter explaining the failure and steps necessary to qualify for a credit and re-inspection. After a successful inspection, the City will notify the owner of the results and credit amount, the effective date and will make the changes to the database.

CALCULATED CREDIT EXAMPLE

The example site is a 10 acre site that consists of woods and meadows with a t_c=10 min (t_c is the computed time-of-concentration for the site). A commercial shopping center is planned to be built on site. 85% of site will be developed. A large detention facility is constructed to handle to total stormwater runoff from the facility.

STEP 1: The property owner or representative obtains a credit application packet from the City.

STEP 2: The owner insures the detention basin is functioning and properly maintained prior to the City inspection. The owner or representative develops a Maintenance Plan that will be submitted as part of the credit application. A few of the specific conditions that must be checked before the City's inspection are:

- The inlet, outlet, overtopping and all other applicable structures are structurally in good condition and are not clogged or blocked.
- The detention basin is cleaned up to remove all trash, excess vegetation and debris.
- Excess sediment is removed to restore the original basin volume.

STEP 3: The property owner or representative measures the basic retention/detention area features and performs a level pool routing of the design storm. This gives $\mathbf{Q_{post}}$. This is compared to a calculated $\mathbf{Q_{pre}}$. From analysis of the retention/detention area topography and outlet structure, stage-storage-discharge tables are created:

Stage (ft)	Storage (ft^3)	Discharge (cfs)
0.0	0.0	0.0
1.0	2,200	3.8
3.0	12,600	6.8
6.0	30,000	9.3
9.0	40,500	11.1
10.0	42,700	11.8

- Level pool routing was conducted using an SCS Type II 6 hr design storm to determine $\mathbf{Q_{post}}$. From level pool routing, the discharge is calculated to be 11.8 cfs for the 10-year storm.
- Calculate $\mathbf{Q_{pre}}$ using the SCS Type II 6 hour storm. Using a 63 curve number and the computed t_c=10 min, a pre-developed peak discharge is computed.

$$\mathbf{Q_{pre} = 12.0\ cfs}$$

The Rational Equation can only be used for drainage areas less than 5 acres.

After the completed application is received, the City will pull the site plan (if available) and provides it and a checklist to an inspector. The inspector will check the retention/detention area and makes some basic measurements to insure the retention/detention area meets minimum design and maintenance requirements. The City will then calculate the credit upon completion of the inspection. If the facility fails the inspection the City will provide a letter explaining the failure and steps necessary to qualify for a credit and re-inspection.

Calculate the credit:

$$P = (1.3 - (11.8/12.0)) * 100$$
$$P = 31.6\%$$

After a successful inspection, the City will notify the owner of the results and credit amount, the effective date and will make the changes to the database.

APPENDIX

Attachments:

1. Credit Application Form
2. Right-of-Entry Form
3. Inspector Checklist for Detention/Retention Area Inspection

CITY OF GRIFFIN
Credit Application Form

Instructions:

Fill out this form completely. A separate application must be made for each separate property location. One application can be made for multiple stormwater detention/retention facilities to be inspected on the same property. Attach a separate sheet giving detention/retention facility location and description for each additional facility on the same property for which you are requesting inspection. Please insure all detention/retention facilities are in a proper state of repair and maintained.
Fill out and attach a Right-of-Entry Form (Form 2). Mail the completed form, Maintenance Plan, and Right-of-Entry to: City of Griffin, Public Works Department, PO Box T, Griffin, GA 30224

Parcel Identification Number (if known): _____
Site Location: _____
Street Address

_____
City State Zip

Authorized Contact: _____
Name & Title (last, first and title)
Contact Mailing Address: _____
Street Address

_____
Phone/Fax

I hereby request the City of Griffin review this application for a stormwater service fee credit. I further authorize the City of Griffin to inspect the above identified stormwater facility(ies) for the purpose of assessment for a stormwater service fee credit. I certify that I have authority to make such a request and grant such authority for this property. The attached information is true and correct to the best of my knowledge and belief. (This form must be signed by the financially responsible person if an individual, or if not an individual by an officer, director, partner, or registered agent with authority to execute instruments for the financially responsible person). I agree to provide corrected information should be there be any change in the information provided herein.

_____ _____
Type or print name Title or Authority

_____ _____
Signature Date

Closest Cross Street: _____ **Distance and Direction from Cross Street:** _____

Side of Street (North, South, etc.): _____ **Landmark(s):** _____

Generally where on the site is(are) the facility(ies) located. Attach sketch if appropriate.

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STORMWATER FACILITY CALCULATIONS AND INFORMATION (Continued)

Owner's Representative (Engineer):
Name: _____
Address: _____
Street Address

_____
City State Zip Phone/Fax

Georgia Registration Number (PE): _____

TOTAL SITE CHARACTERISTICS (Site plan attached as Attachment _____)
Total Site Area: _____ acres
Total Site Impervious Area: _____ acres (sum of the three below)
Paved Area: _____ acres Roof Area: _____ acres
Other Impervious Area: _____ acres (explain)

STORMWATER FACILITY GENERAL INFORMATION
(for the following items attach separate sheet for each facility)
Facility ID:_____
Facility Location on Site:_____
Description of Facility:_____
_____
_____
_____

HYDROLOGIC CHARACTERISTICS
(Area delineated as shown in Attachment(s) _____)
All values requested pertain to the drainage area into the Facility being analyzed only, not the whole site.

Pre-development
Method used (check one) ❑ Rational Method ❑ SCS Curve Number method
Drainage Area to Facility: _____ acres
Runoff Coefficient: _____ (C Factor or SCS Curve Number)
Time of Concentration: _____ min (5 minutes minimum)
Rainfall Intensity (Rational Method only) _____ in/hr
Storm Duration (SCS method only) _____ hours (use same duration for routing calculations shown below)

Q_{PRE} _____ cfs

Post-development
Method used (check one) ❑ Rational Method ❑ SCS Curve Number method
Drainage Area Impervious Acreage: _____ acres (sum of the three below)
Paved Area: _____ acres Roof Area: _____ acres
Other Impervious Area: _____ acres (explain)
Runoff Coefficient: _____ (C Factor or SCS Curve Number)
Time of Concentration: _____ min (5 minutes minimum)
Rainfall Intensity (Rational Method only) _____ in/hr
Storm Length (Rational Method only) _____ minutes

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DETENTION/RETENTION FACILITY DATA (All calculations are at Attachment(s) _____)
Facility Storage Volume at Overflow _____ ft^3
Inflow Hydrograph Peak Flow _____ cfs

Q_{POST} = Routed Hydrograph Peak Flow _____ cfs
Flow through outlet _____ cfs
Flow over emergency spillway _____ cfs

Attach stage-discharge-storage information in tabular form, storage volume calculations, outlet description, overflow description, runoff calculations, and all other pertinent information necessary to perform a detailed review.

ENGINEER'S CERTIFICATION:

I hereby certify that the detention/retention facility(ies) has (have) been constructed in substantial conformance with pertinent design requirements and that the detention/retention facility(ies) is(are) in an acceptable state of maintenance and repair. I further certify that these calculations, technical details and information provided reflect accurately the condition of the detention/retention facility at the time of my inspection.

_____
Signature and Seal of PE

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CITY OF GRIFFIN
Right-of-Entry

_____ Hereinafter termed "Owner" and the CITY OF GRIFFIN, hereinafter termed "City" in consideration of the mutual promises of the Owner and City hereinafter contained, agree upon the following terms for the entry of the City and its representatives as set forth herein upon the real estate hereinafter described:

_____
_____
_____
_____
_____

"Owner" hereby grants to City, its employees, agents, consulting engineers, contractors and other representatives the right to enter upon the above described real estate on and after _____ , _____ _____, for the purpose of inspecting on-site stormwater controls which work shall be completed strictly in accordance with the standard practice of Public Works.

The City shall, as soon as practicable after completion of the work as above described, cause all affected property of the Owner to be restored to its original condition as nearly as reasonably possible.

"Owner" hereby covenants with City that he/she is/they are the true and lawful owner of the above described real estate and has/have lawfully seized of the same in fee simple and has/have the right and full power to grant this right of entry, which right of entry shall cease to be effective on completion of the above described inspection.

"Owner" will not charge City rent or other compensation during the period of time City occupies the said real estate for purposes aforesaid under the provisions of this right of entry.

IN WITNESS WHEREOF, the parties have caused their respective names to be signed hereto on the ____ day of _____, 19____.

_____
OWNER

_____
REPRESENTING THE CITY OF GRIFFIN

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CITY OF GRIFFIN
Inspector's Checklist for Detention/Retention Facility Inspection

Instructions to Inspector:

Make contact with the authorized contact from Form 1 and notify of and coordinate site inspection. Authorized contact or owner need not be present for site inspection though inspector should make every effort to accommodate authorized contact's availability to accompany inspector.
Fill out the form completely only if the facility is in proper state of maintenance and repair. If not in proper repair and maintenance fill out only the "General Information" and "Maintenance and Repair" sections and return to Director of Public Works.
If site plans were supplied by Public Works and all dimensions and necessary site improvement details can be checked against the plans, then only deviations from the plans should be noted and annotated in red pen on the plans. If plans are used, check the blocks in the "Facility" and "Drainage Area" sections.
If site plans are not available or not used fill out all sections fully.
Attach Form 1 and return to the Public Works.

General Information

Inspector's Name: _____ Date Inspected: _____

Attach Form 1 for General Information

Maintenance and Repair

Description	YES	NO[1]
Is facility clear of debris or vegetation that may block outlet?		
Is facility clear of sediment deposits which significantly reduce storage volume?		
Is facility inlet, outlet in good repair to allow proper function?		
Is the facility emergency overflow in proper repair and not eroded?		
Comments on "NO" check marks:		

(1) Note: A "NO" check will void the credit application. When the condition is remedied, a new application may be submitted.

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Inspector's Checklist for Detention/Retention Facility Inspection (continued)

Site Plan Available? **Yes** ☐ **No** ☐

[Check block refer reviewer to City supplied site plan. If all necessary information is not supplied on the site plan give additional information here.]

Primary and Emergency Outlet Dimensions and Layout (provide sketch with dimensions):

Note: Outlet information must be sufficient to develop a rating curve for the facility.

Pond Layout (provide sketch with approximate dimensions):

Note: Dimensions and sketch must be sufficient to calculate volume of storage area from lowest outlet elevation to top of overflow point.

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