



CITY OF FAYETTEVILLE

Stormwater Program Evaluation

Report / July 27, 2018

TABLE OF CONTENTS

1.	EXECUTIVE SUMMARY	1
2.	INTRODUCTION	3
2.1	BACKGROUND	3
3.	CURRENT PROGRAM OVERVIEW	1
3.1	STORMWATER MANAGEMENT	1
3.2	CAPITAL PROJECTS AND STUDIES	3
3.3	PRIVATE DAMS	4
3.4	STORMWATER ADVISORY BOARD.....	5
4.	STORMWATER REQUIREMENTS AND PLAN REVIEW	5
4.1	REQUIREMENTS.....	5
4.2	DESIGN STANDARDS	6
4.3	REVIEW PROCESS.....	6
4.4	TIMELINE.....	8
4.5	ENFORCEMENT.....	8
4.6	DEVELOPER AND DESIGNER FEEDBACK	9
5.	PEER REVIEW	9
5.1	CITY OF DURHAM, NC	10
5.2	CITY OF GREENSBORO, NC	13
5.3	CITY OF WINSTON-SALEM, NC.....	16
5.4	CUMBERLAND COUNTY, NC.....	18
5.5	CITY OF GREENVILLE, NC	19
6.	STORMWATER FUNDING	22
7.	OBSERVATIONS & RECOMMENDATIONS	23
7.1	STORMWATER REQUIREMENTS.....	23
7.2	STORMWATER PLANS REVIEW	24
7.3	STORMWATER MANAGEMENT & CAPITAL PROGRAM.....	25
7.4	STORMWATER FUNDING	26

1. EXECUTIVE SUMMARY

The City of Fayetteville has experienced tremendous growth over the last few decades, which, though a boon to the City and its residents, is straining the City's stormwater system. Given its geographic position along the Cape Fear River and its low topographical profile, the City of Fayetteville is prone to flooding, which the City manages as part of its goal of protecting public health and safety. In 2008, the City took a step toward reducing flooding problems when City Council adopted a Stormwater Control Ordinance that introduced specifications for managing stormwater runoff from new development and redevelopment. The ordinance requires developments to retain stormwater runoff on the property long enough to ensure that the change in development in one location does not cause detrimental flooding impacts downstream. The ordinance also requires treatment of stormwater runoff for water quality, as required by the state.

During early 2018, Raftelis Financial Consultants (Raftelis) conducted a high-level review of the City's Stormwater Program, with a focus on the City's stormwater requirements for development and the plans review process. As part of this process, Raftelis interviewed stormwater plans review staff or managers in 5 peer NC municipalities as well as Cumberland County.

The City's stormwater treatment requirements are not out of line with its peer communities. All but one have similar or more stringent requirements for water quantity control, and for that different community, sensitive watersheds do have the same standards. All peer communities have more stringent requirements for water quality.

There is reason for concern about Fayetteville's Stormwater Plans Review process. The City's process attempts to be customer friendly to the detriment of efficiency and timeliness. The result is a set of processes that slow the review and burden the already short-staffed department with unnecessary and redundant tasks. The fact that the City struggles to get plans reviewed in 30 days, while peer communities are generally completing reviews in about 10 days, is a testament both to the need for additional plans review staff as well as the difficulty introduced through flexible or unevenly enforced submittal requirements. Raftelis recommends a slate of revisions to the practices and policies to ameliorate these issues.

Though this does not constitute a formal staffing study, Raftelis was struck by the limited growth in staffing levels amidst the enormous growth of the City these staff serve. The Stormwater Program only added one position in 10 years, while City growth has been occurring at over 6.5% a year and the large annexations added a lot of poorly-functioning drainage infrastructure to the City. This is critically relevant to the plans review staff, who have an ever-increasing number of plan submittals to manage. While in the past it may have seemed like development would slow down any moment, this simply hasn't occurred, and there's no evidence that it is about to. We recommend increase staffing across all functions of the stormwater program to the extent that it can be supported in concert with an increased contribution to the capital program. The Stormwater Funding recommendation accompanying this report plans for a marginal increase in staffing in the near term.

Amidst the increased pressure on the Stormwater Program and staff, the City's Spot Repair program has emerged as an innovative and effective way to deal with smaller projects that might never rise to the priority

level to be dealt with through the larger capital program, but which could, if left unresolved, lead to greater flooding or water quality issues. Raftelis is impressed by the structure and execution of this program as an example of proactivity even in circumstances of limited capital funding.

The City's Stormwater Program is complex and comprehensive. However, it does not currently include a Local Erosion and Sediment Control program, which is managed by the State. The City could set up a fee structure to recover all costs associated with running a new Erosion Control Program. Taking local control of this program and its activities would not only empower the City to make decisions and take enforcement action on construction site issues, but it would also create a more holistic approach to stormwater management during and after construction.

Raftelis' additional work to determine how to accelerate the capital program and gain ground on the growing stormwater management and flooding problems resulted in a recommended \$1.75 per month stormwater rate increase, which was approved by Council to go into effect in FY2019. This money should be used to jump-start the watershed studies, which in turn would support a proactive capital program. The increased funding could also allow the City to add staff to key roles, like project management, to oversee the completion of known and newly identified capital projects.

Through implementation of the policy and process recommendations contained herein, the City can start to get ahead of the enormous plans review workload. At the same time, with increased financial support, Fayetteville's stormwater program will achieve important planning and capital successes and begin a shift toward proactive system management. The City is well-positioned to have a leading Stormwater Program among its peers in the near future, but only with the ongoing support of Council and other stakeholders.

2. INTRODUCTION

2.1 BACKGROUND

The City of Fayetteville is the primary urban center of southeastern North Carolina. It has experienced tremendous growth over the last few decades, which, though a boon to the City and its residents, is straining the City's stormwater system. Given its geographic position along the Cape Fear River and its low topographical profile, the City of Fayetteville is prone to flooding, which the City manages as part of its goal of protecting public health and safety. Stormwater management has been an important topic for the public recently, as identified through two recent citizen surveys.

In 2008, the City took a step toward reducing flooding problems when City Council adopted a Stormwater Control Ordinance that introduced new specifications for managing stormwater runoff from new development and redevelopment. The ordinance requires developments to retain stormwater runoff on the property long enough to ensure that the change in development in one location does not cause detrimental flooding impacts downstream. The ordinance also requires treatment of stormwater runoff for water quality, as required by the state.

The introduction of stormwater runoff control and treatment requirements for new development changed the development process within the City. It also created a contrast between the development process in the City and that in unincorporated Cumberland County. Stormwater management requirements are minimal in the County.

Through its actions beginning in 2008, Council recognized the important relationship between proactive stormwater management and mitigation of flooding. That relationship was also acknowledged around 2010 as the City approved two watershed studies and two neighborhood studies to identify areas where the drainage system was in need of major repair or replacement, and again when it approved a rate increase for FY2019 to accelerate the pace of those studies.

Despite the strong actions of the City beginning almost a decade ago, the Stormwater Management Program's goal of proactive, sustainable stormwater management is challenging and the goal is not fully met for several reasons that are discussed in detail in this preliminary report. One of the main reasons is the level of funding and support for capital projects, as well as staffing within the program, has been insufficient to keep up with community growth. There has also been pushback about the development requirements being too onerous, especially compared to the County. At the same time, major flooding issues continue to occur in some parts of the City (notably, flooding in Liberty Hills has been in the news for years) due to gaps in enforcement of Ordinance requirements, which undermines the previously supported notion that proactive management can alleviate those issues.

The current City Council understands the critical need for a well-functioning drainage infrastructure. Hurricane Matthew, which hit Fayetteville in the fall of 2016, wrought havoc on the City system, making existing issues apparent and creating new ones. In that moment, the entire community could appreciate the

need for an effective drainage system and program. At the same time, however, rules around stormwater management requirements have been under fire, and there is a strong desire within the influential development community to revisit and revise the terms of the Ordinance.

In 2017, the City of Fayetteville engaged Raftelis Financial Consultants, Inc. (Raftelis) to conduct a stormwater program evaluation, focusing on the stormwater management requirements for development and the plan review process, in an effort to shed light on program successes or improve upon program deficiencies, as appropriate. The project was later expanded to include a limited review of program funding sufficiency, and evaluating potential for funding additional watershed or city-wide stormwater studies beginning July 1, 2018. The full project scope is discussed below. Raftelis has prepared this preliminary report and welcomes feedback from City staff and management.

2.1.1 Project Scope and Summary

The project, as described below, was a relatively high-level review of the stormwater program as a whole, with a focus on the stormwater plan review process. Raftelis' goal was to learn about internal policies and processes from a variety of different perspectives, and to gather information from staff in all positions about their perceived program successes or inefficiencies. To that end, our process involved an intensive set of meetings on site with staff to learn about and develop an initial evaluation of the program, followed by a set of peer community interviews, and formal identification of program refinements. This report documents the information gathered through each task and summarizes final observations and identified immediate program refinements.

Task 1: Initial Program Evaluation

Raftelis consultants met with City staff and held interviews over the course of two days to learn about the program, including the level and extent of services provided, and the people and processes behind service provision. Raftelis also gathered detailed information about staff accomplishments, stormwater program finances, and future service plans. As part of these individual and small group conversations, we acquired information from a variety of perspectives about the development processes and perceived or known difficulties. The findings from Task 1 are included in Section 3, and became the baseline for comparison in Task 2, and were the inputs for the final program evaluation.

Task 2: Development Process Review for Peer Communities

The City was interested in learning how its development process compares to the processes implemented in peer communities. Raftelis designed a survey for peer communities focusing on understanding processes as implemented, and on internal and undocumented policies and norms. The survey results are included in Section 5 and became an input for Task 3.

Task 3: Identify Immediate Program Refinements

Based on the knowledge Raftelis obtained from Task 1 and Task 2, we identified a set of quick program tweaks that could make the program more efficient or alleviate concerns identified through interviews. These are summarized in Section 7.

Task 4: Identify Follow-Up Evaluations and Scheduling for Phase II

The work described in Tasks 1 to 3 focus on the immediate concerns of the Stormwater Program, but there are other areas related to program evaluation the City is interested in exploring. While Task 3 addresses

immediate action items, Task 4 involves identifying more involved recommendations coming out of this Phase that require additional effort. Under Task 4, we will develop additional services as needed, and will quantify the level of effort required for those services under a Phase II services scope. Task 4 will occur after initial staff review of this draft report.

Task 5: Conclusions and Reporting

This draft report falls under Task 5. This task also includes four final meetings to debrief program staff and management on the findings and engage in discussion that will influence the Phase II goals and Task 4 estimations. Raftelis will meet with City staff, the City Management Office, the Stormwater Advisory Board, and City Council, and will refine conclusions and recommendations as needed after each discussion.

Amendment Task 1: Evaluate Additional Potential for Funding Watershed or City-wide Stormwater Studies Beginning July 1, 2018

Raftelis looked at an immediate funding increase as part of the high-level program evaluation and identification of opportunities for near-term program or process improvements. This effort was not as detailed as a financial plan or rate study, but was meant to inform a near-term choice on a rate increase that could be effective July 1, 2018 and that could speed the funding of studies that will forecast longer-term capital project needs. Raftelis provided a separate memo including a rate adjustment recommendation based on this effort, which is included in this report as Appendix A. This was presented separately to Council.

3. CURRENT PROGRAM OVERVIEW

Raftelis met with staff involved in all elements of the stormwater program over the course of several days of in-person meetings and follow-up phone calls. The group that provided input forming the basis for the Current Program Overview and Observations, below, include the City Engineer, Stormwater Manager, Deputy City Manager, Stormwater Inspectors, Drainage Investigations & Spot Repair Program Staff, Project Managers, Engineering Specialists, Construction Inspectors, Finance/Budget, Development Services Director and Assistant Director, Development Advocate, Zoning Officer, Building Official, Public Services Coordinator, Stormwater Hotline Attendant, and Assistant City Attorney.

3.1 STORMWATER MANAGEMENT

The City's Stormwater Management Program is composed of numerous functions performed in concert to maintain the drainage infrastructure and ensure compliance with the MS4 permit and other regulatory obligations. In December 1994, the City of Fayetteville began operating under a Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit with its co-permittee Cumberland County, as issued by the North Carolina Department of Environment and Natural Resources (NCDENR). This permit has been renewed every five years since that time, most recently in 2018. As annexation brought the more urban parts of Cumberland County into the City, the County's population was reduced beneath the MS4 threshold and that jurisdiction was relieved of the obligation. The County no longer has an MS4 permit or the development requirements that would be associated with it.

The overarching goal of the program is to reduce flooding and protect public safety across the 94-square mile service area (outside Fort Bragg) while maintaining water quality in the City's receiving waterbodies. Section 3.1 describes the ongoing management activities. Related work associated with large capital projects is discussed in Section 3.2.

3.1.1 Drainage Inspections & Maintenance

The City's stormwater infrastructure – including curbs and gutters, pipes, inlets, culverts, and ditches – is the backbone for growth and development across the region. Without effective conveyance of water out of public rights-of-way and off private property, public safety and the quality of life would deteriorate. This infrastructure moves stormwater through the City to receiving streams. A large part of the City's stormwater program is ongoing drainage inspections, maintenance, and improvements.

Drainage inspections are largely driven by citizen complaints through the stormwater hotline, which are addressed within 72 hours. These complaints are typically about standing water on private property, or minor maintenance issues, including ditch maintenance, creek cleaning, and clogged inlets. Some are more serious, such as sinkholes or pipe cave-ins. Drainage inspectors or one of two maintenance crews will be dispatched to address the issue, with the priority on issues that are in the street right-of-way.

Staff will investigate identified issues of flooding or compromised infrastructure, and will work to get minor issues repaired, and large issues added to the Capital list, some of which could be addressed through the City's Spot Repair program. About 80% of the City's system is accurately mapped, and the focus of drainage

inspections, other than in response to citizen complaints, is on pipes that are 36" and larger, but most problems are in the smaller, more numerous pipes. City staff don't have the manpower to proactively inspect the entire system right now.

As described in the City's Stormwater Management Plan, maintenance activities include "cleaning inlets of debris and sediment, maintaining channels to reduce erosion and maximize pollution reduction capabilities, and the removal of blockages." Stormwater improvements to the system include "solving watershed scale infrastructure problems, channel stabilization, safety improvements, stream habitat enhancement, water quality enhancement, and resolving flooding problems associated with stormwater generated from public streets."

3.1.1.1 Work Order System

Inspectors use CityWorks to manage work orders. While a potentially valuable tool for managing workflow, staff have observed drawbacks in its efficacy. Importantly, in the field, there have been issues with network connectivity, making it cumbersome and time-consuming to enter work order information or updates. For those or other reasons, there is the impression that not all staff use the system regularly, and that it may not always contain the most up-to-date status of a work order. This can leave communication gaps between the Maintenance and Inspection groups. Fayetteville IT is already working on solving this problem through a proprietary application intended to work on staff's smartphones, which should not have the same connectivity problems.

3.1.2 IDDE & Post-Construction Inspections

The City has a small but dedicated staff of four that conducts inspections for various elements of MS4 compliance. These inspections include restaurants, industrial sites, City facilities, and outfalls. This group also inspects stormwater structural control measures (SCMs) after they have been constructed and have reached their first annual inspection. The focus is on finding any evidence of structural instability, lack of maintenance, erosion, cracks in outlet or inlet, animal activity or other issues that need to be addressed. These inspections do not absolve SCM operators from having to conduct thorough inspections and submitting results to the City annually. The City has struggled to get operators to turn in the appropriate paperwork each year.

With the new MS4 permit in 2018, the City has a renewed focus on post-construction inspections. At the time of the interview, one Stormwater Inspector position was vacant, which made completing all required inspections very difficult.

Staff do regular inspections to detect illicit discharge from likely sites such as restaurants, dumpster pads, and other developments that tie directly into the City infrastructure. Good housekeeping inspections are conducted for City facilities, and informal construction site inspections for City construction projects. Industrial facilities and the PWC Vehicle Maintenance Yard hold their own stormwater permits, but City inspectors check for appropriate outdoor material storage (asphalt, concrete, oil). The City is responsible for doing industrial inspection and reporting findings to the state. Enforcement is ultimately the responsibility of the state.

IDDE inspections also require investigations and sampling at outfalls and culverts. Major outfalls are tested annually and tested 72 hours after a rain event. Where water is found flowing from outfalls, inspectors can trace it back to the source, and often find carwashes as the source of illicit discharge. Ambient streams are tested quarterly and 72 hours after a rain event, and are tested again if results show that a parameter is high. Stream segments on the 303(d) list are sampled monthly.

3.1.2.1 MS6 Program

The City has an MS4 permit, but engages in what is known as EPA's MS6 program, which facilitates sustainable community stormwater management programs that focus on program effectiveness and efficiency. This program connects participating cities across the state so they can engage in information sharing and peer reviews. Participating permittees are able to audit one another's programs on a regular basis to ensure appropriate adherence to the rules and to encourage cooperation and coordination between participants.

3.1.3 Outreach and Public Information

As part of the minimum control measures met under its MS4 permit, the City engages in a comprehensive outreach and public information strategy. There is one dedicated staff person who coordinates and represents the Stormwater Management Program at local events. This person also manages the Program's social media presence and coordinates TV and radio advertisements. Messaging is generally about good stormwater management practices in the home.

The department also maintains a hotline for customers to call with questions related to stormwater. Typically, these calls are about flooding, ditch maintenance, or clogged inlets. A City representative mans the hotline and gathers enough information from the customer to figure out which crew to send, prioritize the issue, and provide the customer additional information about stormwater or stormwater bills.

The Stormwater Advisory Board serves as a means of outreach as well. It is discussed in a later section.

3.2 CAPITAL PROJECTS AND STUDIES

To date, the City has undertaken limited effort to identify and prioritize opportunities for capital projects to improve stormwater management throughout the City. The City recently conducted a study of a portion of Beaver Creek Watershed and one neighborhood study, while others are underway. Those projects identified approximately \$36 million in unfunded capital needs, and covered about a sixth of the City. Extrapolation of that figure results in an estimated \$200 million in capital needs.

Studies such as those completed by the City serve a dual purpose. They allow for capital project needs to be identified, but they also create an opportunity to look at the system in logical sections, ensuring that flooding problems fixed in one place are not simply relocated to another. Issues can be prioritized among and across individual basins within the City, and resources can be allocated more effectively.

At the time of the on-site interviews, Stormwater staff were overseeing 12 capital projects in addition to several smaller projects managed through the Spot Repair Program addressed in the following section. The projects on the current list came from watershed and neighborhood studies, as well as from issues identified

during routine drainage investigations. Several years ago, the outstanding projects were prioritized, and that prioritization is generally still in use.

The City has a known backlog of approximately \$19 million in stormwater projects. Currently, the City's capital program is barely addressing the enormous need, known and unknown, across the City. Capital project funding is necessary for the health of the system, and the longer the City goes without adequate funding, the greater the impact of the delay, which can lead to more issues than unmitigated flooding alone. The delay between project identification and execution can add significant costs to project administration and management. Unaddressed infrastructure problems can exacerbate upstream or downstream issues. Most importantly, delays can result in a severe disconnect between original bid and actual project costs since construction costs have been rising faster than the standard inflation rate for years. This is a critical point, as it means that the longer a project remains on the growing list, the further out of date the original cost estimate is. While Engineering and Stormwater program staff present best estimates for a project cost originally, that likely cost will inevitably change over time, and staff are put in a position where they must revise estimates or ask for additional allocations from Council.

Currently, capital projects are largely funded, at a level of approximately \$3 million per year, through rate revenues, using pay-as-you-go or PAYGO financing. A single project remains from the City's 2011 stormwater revenue bonds.

3.2.1 Spot Repair Program

The Spot Repair program was put in place during FY2017, and represents one of the most innovative ways the City is dealing with its long list of capital project needs. Capital projects that are relatively small tend to be and remain a lower priority than larger projects. Rather than continually prioritizing other projects above them, the City has implemented the Spot repair program to use some PAYGO capital funds each year for projects with expected costs of \$100,000 or less. The way these projects are executed is also quite flexible – sometimes with City resources if they have capacity, other times with outside consultants and engineers. This year, the program has completed 6 projects and is currently working on 4 more.

3.3 PRIVATE DAMS

Unique to Fayetteville is its openness to assist with private dam investigations. The State's information listed 55 dams within the city limits, 45 of which are privately owned and maintained. Though private dams are not part of the public infrastructure, their failure could have severe impacts downstream, causing flooding or undue pressure on the infrastructure. This threat to public safety, paired with the large number of dams within the City, gives the City has a compelling reason to help ensure dam functionality.

The City does not independently do any dam oversight and historically, it has not been involved in any aspect of private dam maintenance; rather, dams are overseen by State's Dam Safety office under DEQ. Several dams have public streets on top of them, but the City does not own or maintain anything under the street, and dam maintenance is the responsibility of the owner. The State's documentation has confused the owner of some dams in this situation, naming the City as the responsible party.

In extraordinary circumstances, City Council has spent Stormwater funds on dam evaluations, in response to residents' concerns about dam safety and in acknowledgement of the relationship they have with the public

infrastructure. Before Hurricane Matthew, the policy around private dams allowed dam owners to access a revolving fund, or to petition for a special tax assessment to raise funds for fixing issues. Hurricane Matthew destroyed numerous dams, making the existing policy insufficient to address the need. In response, the City amended its policy such that citizens can petition Council for an initial “Engineering Evaluation,” which would determine the repair needs, cost, and define the beneficiaries of the repair. Based on the outcome of that initial evaluation, the City may issue a loan to fix the dam, which would be recouped through a special assessment of benefitted properties. At the time of the interviews, the City was in the process of getting six private dam Engineering Evaluations done. Results will be presented to Council and the communities.

3.4 STORMWATER ADVISORY BOARD

The City’s Stormwater Advisory Board (SWAB) meets monthly to discuss the Stormwater Management Program, and formulates advice to City Council on various elements of that program. This group also serves as the first body to hear appeals regarding illicit discharge detection and elimination (IDDE) violations, which are prohibited under the City’s MS4 permit. The SWAB comprises individuals from a wide array of background disciplines, from engineering to business to real estate.

In the past, this group has focused on recommendations to Council related to fee increases to support program functions. Because these individuals are keenly aware of program functions and spending, they are well suited to offer advice in other areas of program management too. For example, the SWAB could develop independent opinions on the development review process, the focus of this study, to provide to Council to counter or support, as necessary, the input Council is receiving from developers or other parties. This group has potential to guide Council, which in turn guides Engineering and the Stormwater Management Program – through promulgation of City Code and allocation of funding – on numerous important stormwater issues including master planning for capital projects, annual budgeting, and program policy and processes.

4. STORMWATER REQUIREMENTS AND PLAN REVIEW

4.1 REQUIREMENTS

Within City limits, some new development and redevelopment triggers the requirement for stormwater treatment, if needed, to meet Stormwater Management Ordinance requirements. Developments can be exempt from these requirements if they are:

- A single-family home, not part of a common plan 2 lots or greater
- Disturbing 20,000 square feet or less for new development
- Adding 5,000 square feet or less of impervious area for additional development
- Not likely to negatively impact neighboring properties
- Not in an area already identified as sensitive to drainage issues through a drainage investigation or watershed study

For developments that are not exempt, the post-development condition must meet two primary standards. First, it must not produce a higher peak runoff rate than the pre-development condition for a 10-year, 24-

hour storm. If the downstream drainage system cannot accommodate that volume, the Ordinance requires that the discharge be further reduced. Second, it must retain the first inch of rain from a storm for a minimum of 48 hours to allow suspended materials time to settle out, to achieve an 85% reduction in total suspended solids (TSS).

The Ordinance outlines slight differences between high-density and low-density development, the former defined as any development of more than 24% impervious coverage, and requiring a larger setback from streams.

For developments with disturbed area over an acre, the state imposes requirements for erosion control, issues grading permits, and conducts inspections. City staff oversee the conversion of any sediment basins used to comply with construction requirements to stormwater control measures used to comply with Ordinance requirements.

4.2 DESIGN STANDARDS

To meet the water quantity and quality standards laid out in the Ordinance, developers have the option to use many different types of Stormwater Control Measures (SCMs) described in the State's Minimum Design Criteria manual. Most frequently, wet ponds are selected as the SCM of choice, but as fewer large lots that support that design are available, developers and their engineers are moving to other forms of treatment. In addition to those known and well-documented SCMs, the City allows the use of proprietary systems, so long as there is data available to support conclusions about the treatment's effectiveness.

4.3 REVIEW PROCESS

The City's Administrative Manual, available on the website, outlines the steps and necessary information for developments to be compliant with the Stormwater Ordinance. Stormwater is only a piece of the broader development review and permitting process. First, any necessary re-zoning happens under Development Services, prior to embarking on the review process. The City convenes a Technical Review Committee (TRC), a group of representatives from most approving or permitting organizations, that begins the process by meeting with a developer and the developer's engineer (herein described collectively as "the developer") to determine what types of permits and approvals are needed. This group meets at the beginning of the review process, but does not reconvene at the end to ensure that all requirements have been met. Given the complexity of the review process, and the existence of this group, meeting at least at the beginning and end of the plans review process (prior to issuing building permits) seems like a simple way to ensure that all parties are satisfied that their obligations have been met. It also creates a space for communication about changes to one submittal that may impact another group's review or decision.

Developers must have, at a minimum, the following permits and approvals to begin their work:

- Water/Sewer Permit – from the Fayetteville Public Works Commission
- Driveway Permit
- Infrastructure Permit – issued by Engineering, includes stormwater, roads, and sidewalks
- Stormwater Plan Approval
- Building Permit – issued by Building Inspections after Infrastructure Permit and Stormwater Plan Approval)

- Erosion Control – from Department of Environmental Quality

Stormwater plan approval is required for an Infrastructure Permit. In all, a developer must go to 5 separate agencies and fill out separate applications for each permit. The City does employ a Developer Advocate, who assists developers with navigating the process, but does not facilitate the funneling of plans, responses, or other information between the developer and City agencies. Rather, developers have access to all individuals working on their respective permits and approvals. The City is working toward a streamlined plan review process, where developers can work with a single point of contact for the entire process, but has not implemented any changes yet.

From a stormwater review perspective, the process appears inefficient. This is evidenced through several big observations:

- 1) Design professionals have access to the individual staff providing reviews. While this could be beneficial to gain clarity on a particular comment or discuss something in detail, it has instead created a situation where design professionals will call and email staff and management regularly to find out the status of their review, and then will become frustrated when responses are not provided immediately. Given the staffing level and the necessity to spend all available time working through outstanding submittals, there is little time to devote to responding to these intermediary requests.
- 2) Design professionals are allowed to submit or resubmit materials in bits and pieces; they are not required to submit complete packages. This means that staff are tasked with maintaining project files and searching through emails and hard copies when something is potentially missing from the package. It would be quite reasonable to require the submitter to compile all necessary information and, once complete, submit it to the City for review or re-review. This would save staff time by cutting out the step of compiling complete packages, as well as help staff manage the steady stream of application materials for numerous projects more effectively.
- 3) There appear to be no strict requirements on how information is provided to the City upon plan resubmittal. Reviewers provide a comment sheet in response to a submittal where comments and questions from various parts of the plan are assembled for the design professional to address. In many places, as noted in the Peer Review section below, design professionals are required to resubmit their plan with a similarly formatted comment response sheet in which they address each original comment and describe how the plan was revised to resolve that issue, or how that issue is resolved without changes. As it stands, design professionals are able to simply submit a new set of plans without directly addressing the original comments, and many comments go partially or entirely unaddressed. This, too, reduces efficiency as the plan must be reviewed completely over again, this time within a 15-day timeframe.
- 4) The City has not been enforcing the payment of its resubmittal fee. Though seemingly minor in the grand scheme of development costs, additional fees would incentivize design professionals to provide complete and accurate information during the first submittal in hopes of obtaining an approval.

4.3.1 Locally Delegated Erosion Control Program

As noted above, Fayetteville does not have a locally delegated Erosion Control Program. Therefore, the State Department of Environmental Quality is responsible for ensuring compliance with construction site standards to limit erosion caused by stormwater runoff from sites one acre or larger. The State is responsible for issuing Erosion Control permits and inspecting construction sites. The City has observed that the latter function does not occur reliably, so City staff assess construction sites as part of other inspection activities and report any non-compliance to the State. While there could be clear benefits to having a locally delegated program – control over the entire process, enforcement for non-compliance during construction, guaranteed device conversion, more accurate recordkeeping, and so on – this is not something the City is prepared to manage at current staffing levels.

Establishing a local Erosion Control Program would be an enormous undertaking, and though it overlaps with many of the other functions of the stormwater group, would require an investment of time and resources to kick off effectively. The City could set up a fee structure to recover all costs associated with running a new Erosion Control Program. Taking local control of this program and its activities would not only empower the City to make decisions and take enforcement action on construction site issues, but it would also serve as another indicator that the City's stormwater management program is comprehensive, and very different from those in rural areas of Cumberland County.

4.4 TIMELINE

City staff estimate that in recent years, they have received 60 original stormwater submittals and 140 resubmittals annually. The three stormwater plan reviewers are required to review first submittals in 30 days, with an internal goal of 20 days. Additional submittals are required to be completed in 15 days, presumably because they should be targeting only items that needed to be addressed. The City's ability to meet these goals is entirely dependent on workflow and staffing. Until about a year ago, approximately 85% of first submittals were reviewed within 20 days. Since then, one of the three reviewers resigned and development has continued to pick up, and it has become difficult to maintain even the 30-day deadline. Fayetteville's review process includes the stipulation that plans not reviewed within the required deadline are automatically approved. This is dangerous, especially when paired with a short-staffed department and increasing levels of development that result in an increasing number of plans automatically approved without the normal rigorous review being completed. There is no evidence that plans tend to be completely accurate or perfectly designed in their first submittal versions. Allowing these plans to be automatically approved undermines the goals of the Ordinance to limit flooding issues and should not continue.

4.5 ENFORCEMENT

Enforcement mechanisms should be in place to guarantee that requirements of the Stormwater Ordinance are being met before, during, and after construction. Before construction, building permits should be held until a stormwater plan is approved. Though this is ostensibly the policy of the City, a disconnect between the Stormwater Ordinance and the Unified Development Ordinance has, in the past, created a disconnect wherein building permits could be issued prematurely. After construction, except for residential subdivision projects, a certificate of occupancy (CO) is generally not issued until the stormwater device has been inspected and is properly functioning. However, there is no mechanism in place to require developers to

request an inspection of the stormwater device. In some cases, temporary COs are issued with a guarantee of stormwater device conversion and performance in the form of a bond.

For residential subdivisions, the City requires a bond for the full amount of conversion costs (down from the original, much steeper requirement of 150% of construction costs) to issue any COs. Still, many devices in residential subdivisions are never converted, and the City has never taken a bond to complete the work itself. In this case, though an enforcement mechanism is in place—one that could be strengthened—the City’s authority is not being exercised and problems persist.

The State, as administrator of the Erosion Control program, is supposed to close out the construction project prior to conversion. This close out step is often not happening either, which represents another area that could be streamlined if the City were to take over the Erosion Control program.

4.6 DEVELOPER AND DESIGNER FEEDBACK

The City has received mixed feedback from developers and designers about both the current requirements and the current plan review process. Local parties who work primarily within Cumberland County and the City of Fayetteville have expressed dissatisfaction with the stringency of stormwater management requirements, bonding requirements, and to a lesser degree, the complexity of the process. Parties who have worked in other cities across the state or in other parts of the country are often more familiar with requirements like Fayetteville’s (or more stringent requirements). They have tended to have far fewer complaints and some have been complimentary of the process.

Fayetteville is not alone in receiving negative feedback from developers and designers. As discussed in the following section, Fayetteville’s peer stormwater utilities, each with different standards and processes, deal with many of the same types of feedback.

5. PEER REVIEW

The City is interested in how its development process compares to the processes implemented in peer communities. Raftelis selected the following five jurisdictions from a peer group based on size, locale, and regulatory environment:

- City of Durham, NC
- City of Greensboro, NC
- City of Winston Salem, NC
- Cumberland County, NC
- City of Greenville, NC

The following section summarizes conversations held with stormwater plan review staff in each jurisdiction, supplemented where necessary with information available online.

5.1 CITY OF DURHAM, NC

The City of Durham has a population of approximately 270,000 and covers 108 square miles. Development within the City is regulated under numerous water quality rules, including those under the Water Supply Watershed Protection Program, three nutrient management strategies for the Neuse River Basin, Falls Lake, and Jordan Lake, as well as an NPDES MS4 permit. The City has a locally delegated Erosion and Sediment Control Program.

5.1.1 Requirements

Durham's stormwater management requirements include both quantity and quality controls. For quantity, peak flow is required to be attenuated to pre-development flows for 1-, 2-, and 10-year, 24-hour storms to prevent stream bank erosion and consequent sediment pollution. The ordinance does allow for additional attenuation requirements.

The City also requires water quality management in the form of nitrogen and phosphorous removal for residential developments that exceed ½ acre of disturbed area or for commercial developments that exceed 12,000 square feet of disturbed area. In the Falls Lake watershed, treatment must be provided to reduce nitrogen to 2.2 pounds per acre per year and phosphorous to 0.33 pounds per acre per year. In the Jordan Lake watershed, treatment must be provided to reduce nitrogen to 4 pounds per acre per year and phosphorous to 0.4 pounds per acre per year. Development in the lower Neuse River Basin must treat nitrogen to 3.6 pounds per acre per year. Rules require a minimum amount of on-site treatment supplemented with credits from off-site treatment.

In addition to these requirements, there is also one stream with a TMDL for bacteria and one with a TMDL for turbidity. For development in the bacteria sensitive basin, development that is otherwise required to put in a stormwater control measure must use one with medium or high bacteria removal. Development in the turbidity sensitive basin requires addressing steps to limit erosion or sediment contribution.

5.1.2 Design Standards

Durham abides by the State's BMP manual, the predecessor to the current Minimum Design Criteria (MDC) manual. The City supplements the BMP manual with an addendum which gives standards that differ from or are more stringent than State standards from the BMP manual. For example, the Durham addendum allows use of Filterra® systems on a case by case basis (treatment assumed to be equivalent to bioretention without internal water storage) and proprietary Silva Cell systems.

Planning standards allow for a variance process, but since stormwater requirements are based on State rules, there is little allowable variance in treatment. If a development does not meet onsite minimum treatment requirements, it will not be approved.

5.1.3 Review Process

Development in Durham, NC generally goes through three stages. First, a property must go through rezoning if required for the proposed development. Next, developers must submit a site plan that proves conceptual compliance with relevant ordinances and outlines the general expectations for the development once completed. Once the site plan is approved, developers must submit construction drawings, the review of

which includes more detailed review of any structural control measure or acknowledgement that one is not required.¹ The site plan and construction drawing review processes are detailed below.

Site Plans

Site plans are submitted to the Planning Department, an agency shared between the City and Durham County. Planning reviews the site plan and determines which groups need to review it. Planning then distributes the plan and collects comments, which it compiles and funnels back to engineers. All comments are written in a comment document, and developers must submit a comment response document. The Planning Department also coordinates any necessary re-reviews.

During this phase, the Planning Department will review some elements of stormwater management that are contained in the Unified Development Ordinance, such as stream buffers and appropriate floodplain demarcation. (Floodplain reviews are rare, and they are done by a different group.) The Stormwater Services Division will verify the stormwater calculations provided by the developer and calculated using the Jordan Falls Lake Stormwater Nutrient Accounting Tool, and will confirm if there is adequate room for the planned control measure.

For commercial development, after a site plan is approved, the developer can obtain a grading permit and a building permit. For subdivision development, before final plat or individual building permits are issued, the developer must have construction drawings approved.

Construction Drawings

Construction drawings are only reviewed by the Transportation, Engineering, and Stormwater Services groups. The Engineering Department is responsible for reviewing water distribution, sanitary sewer, roadways, and stormwater drainage. Stormwater plans detailing stormwater control measures are reviewed by the Stormwater Services group at this stage.

5.1.4 Timeline

Submitted construction drawings are reviewed for completeness each Monday, Wednesday, and Friday. If they are submitted by noon and are complete, they are given immediately to the appropriate reviewing group and logged in that day. Then there is a two-week review period. After comments are returned to the developer, there is no timeline within which developers must resubmit information. As long as the site plan has not expired, developers can pick back up with the last set of construction drawing comments and resubmit their drawings.²

¹ City of Durham, "How to develop and build in Durham." <http://dsc.durhamnc.gov/176/How-to-develop-and-build-in-Durham>.

² City of Durham, "Development Review Timeline & Procedures," <https://durhamnc.gov/387/Development-Review-Timelines-Procedures>.

5.1.5 Enforcement

Durham has several different enforcement mechanisms depending on the development type and stage of development. For most properties, before development has started, the Stormwater Services group can and does put a hold on building permits if necessary to ensure compliance with stormwater rules ahead of development. After development is complete, the City undertakes a rigorous review in the field to confirm that everything been built as designed. This review is done by registered engineers and includes conducting a watertightness test, infiltration testing, geotechnical testing, checking the drainage area, reporting results, and certification. If as-built conditions are far off from the original design conditions, the City may require an engineer to re-model the site to prove compliance with relevant standards.

For commercial projects, developers that have not finished constructing SCMs must put up construction security to obtain a temporary CO. The SCM must be constructed during the duration of the temporary CO, or else the City can pull the security. The City evaluates the completeness of the SCM according to the following scale, and uses it to determine how significant a security to require: Tier 1) SCM is incomplete; Tier 2) SCM is roughly graded, but is still functioning as a soil and erosion device and needs a final grading; Tier 3) Final grading has been completed and the geotechnical report is satisfactory – the last step missing is vegetation establishment, and every square foot has to be 85% vegetated.

For subdivisions, the City cannot hold up building permits or issue temporary COs. Developers must put up construction security that is 125% of the cost of the SCM remaining to be constructed.

To enforce the perpetual maintenance of SCMs, the City requires developers to pay a stormwater permit fee during the construction drawing approval stage that is \$3,500 for most BMPs. The City has a BMP repair and replacement fund that they will draw on in the event of a catastrophe. Developers have the option to contribute 25% of the SCM construction cost to this fund, and if they choose to do so, they will be able to receive a loan from the City to repair their SCMs. Commercial developers can also choose to hold their own maintenance surety that is 20 times the O&M cost, which is often a more expensive alternative than contributing to the City's BMP repair fund.

The City also requires developers to sign stormwater facility agreements that are recorded in the deed and plat books and that require attorney certification. These agreements must be executed before the City can issue water and sewer permits or COs.

5.1.6 Developer Feedback

For first time developers in Durham, the development review process has many requirements that are at first difficult to meet, and it tends to take longer to get a project approved. Once familiar with the process, this is less of a problem. The City receives most complaints from independent engineers who tend to have to resubmit materials many times before receiving project approval.

5.1.7 Other Notes

Recognizing the complexity of their review process, the City is partnering with the County of Durham to work towards a unified Development Services Department, under which all review functions would be

grouped.³ The City is also moving towards requiring a pre-construction meeting with contractors, engineers, and geotechnical engineers to get on the same page about the required documentation and prevent potential problems.

Regarding review process software, currently the City cannot red line plans in their review tracking system software, which does not have the functionality to reconcile multiple edits. For construction drawing reviews, developers must submit hard copies and electronic copies on a CD, and the City will typically review and mark up the hard copies. The City is moving towards transferring comments to the electronic copies and emailing the customer or using a file share with customers.

5.2 CITY OF GREENSBORO, NC

Located in Guilford County, the City of Greensboro has a population of 287,027 and covers an area of 134 square miles. The northeast side of City drains to Jordan Lake, while the southern half drains to Lake Mackintosh and Randleman Lake. Development within the City must comply with Water Supply Watershed Protection requirements and the Stormwater Management Ordinance, which provides enforcement authority for the City's NPDES MS4 permit.

5.2.1 Requirements

Greensboro's stormwater management requirements include both quantity and quality controls. Quality controls are required for high density development, and developers must plan for structural BMPs that remove 85% of total suspended solids (TSS) from runoff from the first one inch of rainfall. The projects must also discharge the post development discharge at a peak rate equal to or less than the predevelopment peak discharge rate for the one year 24-hour storm.

Quantity control is required for all new development sites that increase the net built-upon area of the site by more than 400 square feet or that result in a change to the pre-development drainage pattern. Developers must compare peak runoff for both 2-year and 10-year recurrence storms during a 24-hour rainfall sequence, and if post-development peak flows are greater than pre-development peak flows, developers will need to analyze downstream impacts to determine whether site controls are needed. This is to minimize off-site flooding, drainage, and erosion problems.

For any new development or redevelopment in protected watersheds, developers must submit a Watershed Development Plan to the City for approval. The City regulates four watersheds, and each watershed has its own set of requirements for the maximum percentage of built-upon area allowed for high density and low density developments. The watersheds in the City are: Randleman Lake; Greensboro & Polecat Creek; Lake Mackintosh, most of which is in the City of Burlington; and other watershed districts that drain to Jordan Lake.

³ City of Durham, "About the Development Services Center," <https://durhamnc.gov/3066/About-the-Development-Services-Center>.

5.2.2 Design Standards

The City of Greensboro has created their own stormwater design manual for minimum requirements that is available on the City website. The City's revised stormwater manual is generally in line with the State BMP Manual, and the City only allows for quality and quantity controls that are listed in the State BMP Manual. Developers can also use proprietary systems if they meet State requirements in Chapter 20 of the State BMP Manual.

The City also provides some flexibility in standards. There is little allowable variance in quantity and quality treatment, however, and if a development does not meet onsite minimum treatment requirements, it will not be approved.

For redevelopment sites, the City does allow for a certain amount of impervious area to be grandfathered if the impervious area existed on the site as long as 5 years ago, even if it does not exist at the time of the redevelopment plan submittal. If the impervious area was removed but the property has been billed a stormwater fees within the past 5 years, the City will allow for the removed amount of impervious area to be grandfathered into the predevelopment BUA.

As a general rule, the City tries not to dictate precisely how to meet the requirements. Rather, developers can demonstrate that they are meeting the rules through the method that works best on the property and with the goals of the development.

5.2.3 Review Process

Developers are required to submit complete site plans to the Planning Department through the City's electronic plan review system. The Planning Department determines whether the plan should be reviewed by the Technical Review Committee (TRC), which is required if there is a stormwater plan (and is the path for most non-single family residential development), or the Building Inspections Department. Across the City, there are 14 reviewing departments. Every plan from the TRC comes through to each, and each department are responsible for conducting a review or confirming that a review is not applicable.

For any development increasing built-upon area by more than 400 square feet or development in a water supply watershed, stormwater reports and calculations must be submitted to Stormwater Management staff for review, and the site plan review is done by the TRC.

Once the site plan is approved by the TRC, developers must submit construction drawings. Site development review is done as part of Construction Inspection, during which the City also reviews water, sewer, stormwater conveyance, and sediment and erosion control for the site. Sediment and erosion control is separate from stormwater reporting, and the review has historically been conducted separately from site plan review by the Building Inspections Division. Recently, the review was moved to the Water Resources group. If the development site is greater than an acre, the Sediment and Erosion Control Section will review erosion control plan, grading permits, and conduct inspections.

5.2.4 Timeline

For the first site plan review cycle, the TRC and Building Inspections group will complete reviews within 10 working days. If developers review the City's plan comments and resubmit plans within a week, the City will

turnaround the second review within 5 working days, unless the Planning Department or Stormwater Management group has called for major revisions to the site plan. After developers submit major revisions, such as a new packet of stormwater calculations for the site, the City will usually have another 10 working days to review the second submittals according to a timeline assigned by Development Services.

Though there are no negative consequences to missing the 10-day goal, the Planning Department and Development Services prioritize the 10-day plan review turnaround schedule, and aim to finish reviewing 95% of submitted plans on that timeframe. Both groups track the number of plans submitted and reviewed on a quarterly basis, and report metrics to the Triad Real Estate and Building Industry Coalition (TREBIC), a stakeholder group composed of builders, developers, and engineers that have a working relationship with City Council.

5.2.5 Enforcement

To enforce maintenance of SCMs, the City inspects SCMs with a particular focus on dam and emergency spillways, inlets and outlets, erosion, sediment storage capacity, and water quality. The City will generate a report with recommendations or requirements to improve water quality or restore the SCM to design specifications in a given amount of time. Raftelis' review did not identify requirements for any financial guarantees of SCM performance.

5.2.6 Developer Feedback

The Triad Real Estate and Building Industry Coalition (TREBIC) is a stakeholder group composed of builders, developers, and engineers that have a strong working relationship with City Council. As such, perceptions of the requirements and program are typically communicated through that channel. Greensboro prides itself on being developer-friendly and does not experience much negative developer feedback.

5.2.7 Other Notes

Reviews are done through the City's Electronic Plan Review System, Bluebeam, through which City staff can email comments to developers after reviewing site plans, non-residential building plans, and other submittals. City staff can also load marked-up plans to the system for developers to review. The City does not require anything back from developers except for revised plans. If developers provide a letter responding to comments, the second review is much easier to clear up. Generally, however, the City receives many plans back that do not address all comments. This was noted by review staff as a major issue in the City of Greensboro.

If developers do not submit responses to comments in their resubmittal, the City will provide more detailed comments on what is needed and why, and will also provide guidance on how the developer can comply with the City ordinance and other requirements. On average, plans are submitted three to four times before they are approved by the City, with more resubmittals associated with sites requiring Watershed Protection Plans.

5.3 CITY OF WINSTON-SALEM, NC

The City of Winston-Salem has a population of approximately 240,000 and covers 134 square miles. Development within the city is regulated under NPDES MS4 Phase II permit. The City's Erosion Control Department administers the Erosion Control Program and enforces regulations pertaining to the Water Supply Watershed Protection Program for Yadkin River and Salem Lake.

5.3.1 Requirements

The City's stormwater management requirements include both quantity and quality controls for projects that are considered high-density. According to the City's ordinance, projects that feature more than 24% built-upon area (BUA) are considered high-density and are required to treat stormwater for quality. The ordinance requires on-site treatment for the runoff from the first one inch of rain via a Stormwater Management System, which are designed to remove 85% or more of Total Suspended Solids annually.

For high-density projects that exceed 20,000 square feet of new BUA, the ordinance also requires stormwater quantity management for 2-, 10-, and 25-year storms of minimum 6-hour duration.⁴ In some cases, engineers choose to model 24-hour storms instead. In practice, projects tend to manage stormwater quantity if they are required to manage for quality.

As an alternative to stormwater quantity management, the development team can do a "no downstream impact" analysis. Topics considered in this analysis include flooding impacts on downstream properties, impact on existing stormwater conveyances by increased flow volume, and minimizing downstream erosion due to overland flow and scouring of creek banks.

Both high- and low-density projects are required to have their built-upon area set back from streams by buffers, the width of which varies with the development size. Project located within the Water Supply Watershed are subject to the state-wide regulations in such watersheds.

5.3.2 Design Standards

The City uses the State's most current stormwater design manual as its design standard for on-site Stormwater Management Systems. If a development does not meet onsite minimum treatment requirements, it will not be approved.

5.3.3 Review Process

Development in Winston-Salem, NC generally goes through three stages. First, a property must go through rezoning if required for the proposed development. Next, the developers often choose to have a consultation meeting with the City's Stormwater/Erosion Control Division to review the concept plan prior to beginning design. Once design is finished, developers must submit a Stormwater Management Permit Application and design plans. The concept meeting and application processes are further detailed in the sub-sections below.

⁴City of Winston-Salem, "Post-Construction," <http://www.cityofws.org/Departments/Stormwater-Erosion-Control/Post-Construction>.

The City reviews the application with the accompanying plan and issues a Stormwater Permit if one is required. Exemptions for permits are granted to developers who are working on projects that disturb less than one acre; in this case, the project received an approval of its stormwater management plan. If the application is incomplete or is determined to not comply with the ordinance, the City notifies the developer, who then has 30 days to address the comments and resubmit the application without paying an additional permit review fee.

Concept Plan and Consultation Meeting

The Concept Plan package includes documents detailing existing conditions and the proposed site plan; the inventory of natural resources on the site that highlights any environmentally sensitive features; and the concept plan for the proposed stormwater management system on the site.

A consultation meeting with the Stormwater/Erosion Control Division is suggested but not required by the ordinance. Nevertheless, many developers decide to request once finished with the stormwater concept plan. This meeting helps to determine whether a structural Stormwater Management System is required for the project and, if so, further helps inform the detailed design of the site.

In addition to the Concept Plan, the City requests an assessment of post-construction stormwater impacts of the project upon downstream and upstream properties. These include water quality impacts for projects larger than 1 acre and water quantity impacts for projects with more than 20,000 square feet of new BUA. Projects determined to have adverse downstream or upstream impacts trigger the requirement for a more thorough hydrologic and hydraulic analyses during the design phase prior to submitting the permit application.

Stormwater Management Permit Application

When the developer finishes the detailed design, he can submit the Stormwater Management Permit Application. The permit application is a form that must be accompanied by documentation that addresses stormwater management provisions met by the project. These design plans include engineering reports and sealed design plans, such as the existing and proposed site plans; stormwater management, grading, and drainage plan; utility plan; and erosion control plans.

Any resubmittals must provide new plans with comments addressed. Staff keeps a copy of plans with redlines that have been provided to the developer for reference against resubmittals.

A Stormwater Management Permit or approval is required prior to obtaining a grading permit for the site. For most projects, grading permits are issued by Erosion Control staff. For public projects, however, NC DEQ is the erosion control entity, in which case the grading permit may be issued prior to the stormwater permit being in place.

5.3.4 Timeline

The City is required to review the application and plans within 30 days of submittal. However, the typical turnaround time is 10 days or less. The application is available on the Stormwater/Erosion Control Division website. The application includes a submittal checklist, which streamlines the submittal process for the engineer of record and typically reduces the number of comments.

Each year, approximately 50 plans require a Stormwater management permit to be issued. Out of this estimate, approximately 30 of these require some form of stormwater management. The City has noticed an increase in development and the number of permitted sites, so staff anticipate a 10 to 20% increase in plan submittals in the next year or two. Currently, only one staff person is performing stormwater permit reviews, but the City is trying to recruit another junior engineer to assist with the plan review function.

5.3.5 Enforcement

The permit application includes a provision for an Operation and Maintenance (O&M) Agreement and Manual. These agreements must be notarized, signed by the City, recorded with the Forsyth County Register of Deeds, and a copy provided to the Stormwater/Erosion Control Division prior to the Stormwater Permit being issued. This provision ensures that stormwater on this site will be managed in perpetuity. O&M agreements should include references to easements if the City must provide maintenance for the Stormwater Management System(s) on the site.

The City also requires a financial surety prior to issuing the permit. Typically, obtaining proof of financial surety and the O&M agreement often take longer than the design review.

5.3.6 Developer Feedback

To date, the City has not had much feedback from developers on the stormwater requirements or review process. Citizens have complained about flooding, as noted below.

5.3.7 Other Notes

According to a representative of the Stormwater/Erosion Control Division, stormwater rules for the City have become more stringent over the years. This is especially true for post-construction rules brought about by the most recent NPDES MS4 permit implemented in 2013. Updates to previous rules were implemented within a certain timeframe to comply with the permit. Additionally, the City was receiving many complaints from private citizens and complaints related to drainage issues. Implementing stricter water quantity provisions helped address these concerns.

Currently, the City is transitioning to an electronic plan review process. The Stormwater/Erosion Control Division currently reviews both electronic and paper submittals.

5.4 CUMBERLAND COUNTY, NC

Cumberland County almost entirely encompasses the City of Fayetteville. The County's total population is approximately 320,000; approximately 116,000 people live outside of the City of Fayetteville. The County covers 658 square miles. Development within the unincorporated County is regulated by the Water Supply Watershed Protection Program for Cape Fear River and Cross Creek watersheds. The County does not have any other specific stormwater regulations.

5.4.1 Requirements

The County does not provide stormwater development reviews. If the project is larger than one acre, the developer must obtain a stormwater permit from the State Department of Environmental Quality, Division of

Water Quality (NC DEQ/DWQ). The State will issue a grading permit once any erosion and sediment control requirements are met.

5.4.2 Design Standards

The States Post-Construction Stormwater Permitting Program serves as the permitting authority for stormwater in Cumberland County, and the State's most current design manual is the standard for engineering design of Stormwater Control Measures in the County.

5.4.3 Review Process

The Cumberland County Technical Review Committee (TRC) does not require a meeting with the developer when reviewing stormwater plans. When committee members receive a stormwater management plan, they will forward it to NC DEQ/DWQ for review after giving input on floodplain and/or water supply watershed issues.

The TRC handles development reviews pertaining to the floodplain development ordinance. Water Supply Watershed Protection reviews are administered by the Planning and Inspections office, with some input from County Engineering staff.

5.4.4 Timeline

Generally, the County has a quick turnaround time for plan reviews because they are straightforward.

5.4.5 Enforcement

Stormwater permit enforcement is managed and conducted by NC DEQ.

5.4.6 Developer Feedback

According to the County's Technical Review Committee, the feedback from developers about the development review process has been favorable.

5.5 CITY OF GREENVILLE, NC

The City of Greenville, NC has a population of approximately 91,000 and covers 26 square miles. Development within the City is regulated under NPDES Phase II MS4 permit. The city also has a local delegated Erosion Control and Sedimentation Program and enforces regulations pertaining to the Water Supply Watershed Protection Program for the Tar River.

5.5.1 Requirements

The City of Greenville is in both the Tar-Pamlico and Neuse River basins. The City is currently named in the Tar-Pamlico Stormwater Rules. According to the Rules, stormwater runoff from new development in the Tar-Pamlico basin areas of the City must be treated to limit nutrient export to 4 lbs/acre/year for nitrogen and 0.4 lbs/acre/year for phosphorus. New development projects that exceed these limits may offset the nutrient load increases through off-site SCMs located on existing developed areas that drain to the same stream. For

redevelopment, project teams must achieve the same targets as new development or 70% of pre-development nutrient export, whichever is higher.

The City is not currently named in the Neuse Basin Stormwater Rules. However, the City complies with the rules voluntarily and expects to be named in the Rules as soon as 2019. Voluntary compliance helps the City maintain a consistent approach to stormwater across the whole jurisdiction; the City uses the same threshold for nitrogen export as in the Tar-Pamlico River basin (4.0 lbs/acre/year), even though the Neuse Rules standards are slightly lower at 3.6 lbs/acre/year. Nutrient loading for phosphorus is not enforced in the Neuse Rules. For redevelopment, development can either meet these thresholds or achieve 70% of pre-development nutrient export, whichever is higher. This is enforced only in the Tar-Pamlico Basin.

Attenuation of peak flows regulations help manage the erosion of surface water conveyances. For new development and redevelopment, peak flows must not exceed the pre-development conditions for 1-, 5-, and 10-year frequency storms of 24-hour duration. Attenuation of 25-year, 24-hour storm events are additional requirements for areas of special risk. An exception is made for parts of the basin where the City determines that detaining stormwater can aggravate local flooding issues. Additionally, total suspended solids are managed through individual Stormwater Control Measure guidelines.

Developers and property owners have the option of partially offsetting the nutrient loads from their sites by providing treatment off-site in a developed area. This treated area must drain to the same surface water as the project site. Nutrient offset payments are also allowed.

5.5.2 Design Standards

The City abides by the State's stormwater design manual as its design standard for on-site Stormwater Control Measures (SCMs). The City's Stormwater Management Program guidance document also names the Tar-Pamlico Riparian Buffer Rule as a source of the design standard for measures meant to meet that rule. The program guidance allows for SCMs other than the ones specifically listed in the document if approved by NC DEQ/DWQ.

5.5.3 Review Process

Development in Greenville, NC is permitted through the City's Public Works Department, which encompasses the Planning and Engineering Divisions. The City's Building, Planning, and Development regulations were amended to include the Stormwater Management and Control ordinance. Thus, compliance with the City's stormwater rules is rolled into the general development permit review and does not require a separate permit.

Prior to the issuance of the general building permit, site plans must be approved, including Erosion and Sedimentation Control plans and any relevant Stormwater Management Plans. If the developer chooses to meet the stormwater management obligations through a nutrient offset payment, this payment must be made prior to the permit being issued. The alternative for subdivision developments is the preliminary plan review. The sections below go into detail on the site plan review and preliminary plan review paths to compliance.

Site Plan Review

The most common and straightforward approach to ensuring compliance with stormwater regulations is through the site plan review process. Development and redevelopment site plans are routed through different divisions of the Public Works Department. The Department holds weekly meetings to review plans. Review for compliance with stormwater rules is triggered when a project adds impervious surface and has more than an acre of disturbance for a single-family residential (SFR) parcel or half-acre of disturbance for a non-single family residential (NSFR) parcel.

If the project is found to have to trigger the stormwater rules, the Engineering Division determines that the project requires a Stormwater Management Plan. This Plan requires a separate submittal to the Engineering Division but doesn't require an additional fee. Beyond providing designs to meet the stormwater treatment requirements, the Plan includes an Operation and Maintenance (O&M) Agreement as required by the State design manual. The Division provides comments to the development team as needed and receives feedback during 30-day review period.

Once the site plans, Stormwater Management Plan, and all other requirements of the permit are satisfied, the permit can be issued and construction starts. After construction, the Engineering Division performs as-built inspection of driveways, right-of-way improvements, and stormwater devices prior to the project being issued a Certificate of Occupancy.

Preliminary Plan Review

Developers working on residential subdivision projects typically utilize the preliminary plan review approach as an alternative to the site plan review process. In this case, the project is focused on developing the site by building roads and other infrastructure, including stormwater devices. The developer will then sell lots within the subdivision. When a subdivision is developed in phases, stormwater compliance is evaluated for each phase as it is being reviewed.

During preliminary plan review, the developer would submit a general layout of roads and stormwater devices for high-level review. After approval, the developer submits construction drawings that show the details of all infrastructure, including all improvements in right-of-way and the associated stormwater control measures, as well as a separate Stormwater Management Plan for engineering review. The Stormwater Management Plan requires an O&M agreement, as is does for the site plan approach.

If all are approved, a building permit is issued and construction begins. After construction, the Engineering Division does not issue a Certificate of Occupancy since no structures have been built; rather, the Division issues a final acceptance of the project. The roads are accepted into the City's system, but not the stormwater control measures. The land owner, whether the developer or the homeowners' association, is intended to provide O&M for the stormwater control measures in perpetuity.

5.5.4 Timeline

The Engineering Division has 30 days to review the Stormwater Management Plan once it is submitted to the Division. There is no automatic approval if the 30-day timeline is not met.

5.5.5 Enforcement

The City's Public Works Department requires that the developer provide an O&M agreement for the stormwater control measure and as-built plans prior to accepting the project for final review. Once approved, the Engineering Division issues the Certificate of Occupancy (CO).

The CO is also contingent on the condition of the stormwater control measure. The Engineering Division checks the measure against the site plans, from which it often differs. Sometimes the reason for the difference is that it is the wrong season for plant vegetation. In such cases, a temporary CO can be issued along with a bond for 150% of expected construction cost. These conditions often lead to negotiations with City management or staff prior to reaching a final resolution.

5.5.6 Developer Feedback

The feedback from developers has been uneven. Local developers tend to be more resistant to the stormwater regulations than out-of-town developers. Much of the resistance is due to the slow acceptance to the changes in regulations. Staff noted that in the past, the City struggled with enforcement, which has further slowed acceptance of the changing rules.

Out-of-town developers tend to hold more discussions before beginning the design process. Once they understand the regulations and the permit process, complaints are minimized. The Public Works Department is planning to augment its communication strategy to make the necessary information more accessible and easier to understand. Planned improvements include revision to existing checklists and new checklists for plan and as-built submittals as well as more outreach to the community in general.

5.5.7 Other Notes

Currently, the review process for stormwater management plans is in transition from a manual, paper-based system to a City-wide electronic system. The Public Works department currently receives hard copies of documents for review. Comments are made directly on these documents, which are then scanned and returned to the development teams via email. Tracking is done in a Microsoft Excel spreadsheet database.

The electronic system, Intergov, will track processes across multiple departments, including plan reviews, building permits, and inspections. Phase 1 implementation includes a tracking system to keep up with routing of information. Phase 2 will institute electronic submittals. The system will allow the developers to log in, upload their submissions, track progress of the review, receive comments, and send responses.

The reviewing parties employ several different checklists, which are supposed to clarify up front what the development process entails. There is a checklist for the stormwater plan describing what is required with submittal.

6. STORMWATER FUNDING

The City engaged Raftelis to determine how to accelerate the capital program and gain ground on the growing stormwater management and flooding problems. Raftelis concluded that a \$1.75 increase in the monthly stormwater rate would represent about an additional \$3.2 million, or more than a 40% increase, in

stormwater fee revenue. This could be used to jump-start the watershed studies, which in turn would support a proactive capital program. The increased funding could also allow the City to add staff to key roles, like project management, to oversee the completion of known and newly identified capital projects. A rate study during the planning period will ensure that future rate changes and debt issuances are done responsibly and in accordance with a longer-term financial plan. Fayetteville’s stormwater program will achieve important planning and capital successes and begin a shift toward proactive system management through this rate increase.

The memorandum included as Appendix A summarizes Raftelis’ funding analysis and recommendation.

7. OBSERVATIONS & RECOMMENDATIONS

7.1 STORMWATER REQUIREMENTS

The City’s stormwater treatment requirements are not out of line with its peer communities. As outlined in the table below, most communities have similar or more stringent requirements for water quantity control. Only Greensboro has less stringent requirements generally, but especially sensitive areas within the City are subject to the same water quantity requirements as Fayetteville. and all peer communities have more stringent requirements for water quality. Though Cumberland County is discussed above as a relevant point of comparison, it is not a peer community of the City’s.

Table 1. Comparison of Peer Communities Water Quantity and Quality Treatment Requirements

	Quantity	Quality
Fayetteville	peak flow attenuation from 10-year, 24-hour storm	remove 85% of total suspended solids (TSS) from runoff from the first one inch of rainfall
Durham	peak flow attenuation from 1-, 2-, and 10-year, 24-hour storms	remove 85% of total suspended solids (TSS) from runoff from the first one inch of rainfall; nitrogen and phosphorous removal; bacteria and sediment controls
Greensboro	peak flow attenuation from 1-year 24-hour storm; must analyze downstream impacts for 2- and 10-year 24-hour storms	remove 85% of total suspended solids (TSS) from runoff from the first one inch of rainfall
Winton-Salem	peak flow attenuation from 2-, 10-, and 25-year storms of minimum 6-hour duration	remove 85% of total suspended solids (TSS) from runoff from the first one inch of rainfall
Greenville	peak flow attenuation from 1-, 5-, and 10-year 24-hour storms; 25-year, 24-hour storms for areas of special risk	nitrogen and phosphorous removal

Each of the peer municipalities allow for slight variations in their requirements or in the allowable measures for meeting requirements so long as the goal of the standards are met. Fayetteville also allows developers to use proprietary measures assuming efficacy can be proven. Fayetteville does not allow for any variations from the water quantity requirement. Raftelis believes that a thoughtfully crafted variation in the requirement for developments could allow relief from the detention requirements where it was technically

defensible. For example, site adjacent to larger conveyances might safely release their flows unattenuated and actually eliminate a situation where detention would have caused coincident peak flows that worsened a downstream condition. This would need careful crafting to change the policy to allow flexibility. One option would be to allow engineers to submit a Downstream Impact Analysis reflecting the downstream condition under a reduced treatment scenario. If downstream conditions are unchanged, or if the impact is extremely limited, the City may allow for that variation.

7.2 STORMWATER PLANS REVIEW

Fayetteville's stormwater plans review process appears to be customer friendly, but it has created a set of processes that slow the review and burden the already short-staffed department with unnecessary and redundant tasks. The fact that the City struggles to get plans reviewed in 30 days, while peer communities are generally completing reviews in about 10 days, is a testament both to the need for additional plans review staff as well as the difficulty introduced through flexible or unevenly enforced submittal requirements.

- Design professionals have access to the individual staff providing reviews. While this could be beneficial to gain clarity on a particular comment or discuss something in detail, it has instead created a situation where developers will call and email staff and management regularly to find out the status of their review, and then will become frustrated when responses are not provided immediately. Given the staffing level and the necessity to spend all available time working through outstanding submittals, there is little time to devote to responding to these intermediary requests. Design professionals should have limited access to reviewers, except to discuss technical requirements or comments. The Developer Advocate can play an important role in resolving this issue, as discussed below.
- Design professionals are allowed to submit or resubmit materials in bits and pieces; they are not required to submit complete packages. This means that staff are tasked with maintaining project files and searching through emails and hard copies when something is potentially missing from the package. Raftelis recommends requiring the submitter to compile all necessary information and, once complete, submit it to the City for review or re-review, as is the requirement in peer municipalities. This would save staff time by cutting out the step of compiling complete packages, as well as help staff manage the steady stream of application materials for numerous projects more effectively.
- There appear to be no strict requirements on how information is provided to the City upon plan resubmittal. Reviewers provide a comment sheet in response to a submittal where comments and questions from various parts of the plan are assembled for the designer to address. In many places, as noted in the Peer Review section below, designers are required to resubmit their plan with a similarly formatted comment response sheet in which they address each original comment and describe how the plan was revised to resolve that issue, or how that issue is resolved without changes. As it stands, designers are able to simply submit a new set of plans without directly addressing the original comments, and many comments go partially or entirely unaddressed. This, too, reduces efficiency as the plan has to be reviewed completely over again, this time within a 15-day timeframe.

- The City has not been enforcing the payment of its resubmittal fee. Though seemingly minor in the grand scheme of development costs, additional fees would incentivize designers to provide complete and accurate information during the first submittal in hopes of obtaining an approval.

The observations above relate specifically to the stormwater plan review component of the broader development review and approval process. The City's broader process has room for improvement in effectively facilitating a smooth experience for the developer, and for the City. As observed in the peer communities, the TRC approach – and stormwater permitting being separate and a single part of the broader permitting process – is common. In Fayetteville's case, there is added potential for streamlining the process through the Developer Advocate role. However, currently this function serves more as a conduit to various reviewing parties than as a gatekeeper for reviewers or point person for designers. There is great potential in this role: the Developer Advocate could provide designers with flowcharts, checklists, and timelines to set expectations for the project; he or she could track review status and provide updates to designers, as well as reminders when action is required on the part of the designer. Most importantly, despite the name of that role, it should also function as an advocate for the reviewing agencies. During staff interviews, Raftelis heard examples of developers submitting materials and almost immediately asking about their status (sometimes for the benefit of the owner). In this type of scenario, the Developer Advocate should stand behind City staff and processes, informing the designer when information was submitted and when they should expect a response. This simple shift in approach would limit the amount of time reviewers spend communicating their status with designers directly, and it would set and maintain firm expectations of the City's process.

Currently, the City's Stormwater Ordinance allows for automatic approval if a plan is not reviewed within 30 days. Though the 30-day threshold may become more achievable if the recommendations above and below are implemented, there is no precedent among peer municipalities to have an automatic approval process. Given the frequent imperfections in first submittals, the prospect of having them be approved automatically is a threat to the greater stormwater management objectives. Raftelis recommends doing away with this provision, and instead implementing other measures to support a timely review.

7.3 STORMWATER MANAGEMENT & CAPITAL PROGRAM

The Stormwater Program has a long history of identifying, investigating, and resolving flooding issues across the City. Given the enormous need, limited funding, and limited capacity to execute capital projects, City Council's trust in the capital program has begun to erode. This is in part driven by the City's process of getting projects funded well before they can be completed, or in some cases even started. Costs for construction are ever-increasing, often faster than general inflation costs, which means that a project funded in one year will likely not have enough funding to be completed if it is started in a subsequent year. This leads to additional requests for funding and creates space for skepticism about the Stormwater Program's ability to identify, price, and manage capital projects when in fact time is the only culprit. Raftelis recommends a change in capital program management that supports funding projects only as program staff have capacity to manage them, and in pieces if necessary (design, then construction) and increasing staffing so that capacity is increased. With numerous watershed studies on the horizon, the approach to capital projects should be shifted as soon as possible to be more proactive.

The City's Spot Repair program is an innovative and effective way to deal with smaller projects that might never rise to the priority level to be dealt with through the larger capital program, but which could, if left unresolved, lead to greater flooding or water quality issues. Raftelis is impressed by the structure and execution of this program as an example of proactivity even in circumstances of limited capital funding.

As discussed above, local delegation for the erosion and sediment control program could be beneficial to the City, and it could certainly lead to more effectively enforced construction site management, but not without additional staff and funding to support those activities, which could be recovered through a separate fee.

7.3.1 Staffing and Workload Capacity

Though this does not constitute a formal staffing study, Raftelis was struck by the limited growth in staffing levels amidst the enormous growth of the City these staff serve. The Stormwater Program only added one position in 10 years, an Engineer 1. In the meantime, organic growth has been occurring at over 6.5% a year and the large annexations added a lot of poorly-functioning drainage infrastructure to the City. This is critically relevant to the plans review staff, who have an ever-increasing number of plan submittals to manage. While in the past it may have seemed like development would slow down any moment, this simply hasn't occurred, and there's no evidence that it is about to. We recommend increase staffing across all functions of the stormwater program to the extent that it can be supported in concert with an increased contribution to the capital program. In particular, additional licensed Professional Engineers involved in Plans Review could necessary oversight and backup for that group. The Stormwater Funding recommendation accompanying this report plans for a marginal increase in staffing in the near term.

7.4 STORMWATER FUNDING

Raftelis' recommendations regarding stormwater funding, which are summarized in Appendix A, were implemented by Council in May of 2018 as they voted in support of a rate increase effective July 1, 2018.

