

Exploring Regional Solutions to Regional Problems

Upper Narragansett Bay Regional Stormwater Utility Feasibility Study Phase I

Final Report
June 20, 2014

Prepared for:



City of Providence

On behalf of the Upper Narragansett Bay Regional Stormwater Utility Feasibility Steering Committee (Central Falls, Cranston, East Providence, North Providence, Providence, Pawtucket, Warwick)



With funding from:

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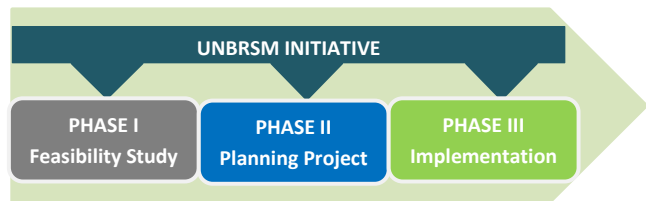
Executive Summary

Background

In 2013, seven municipalities at the head of Narragansett Bay began exploring regional approaches to addressing stormwater management. Central Falls, Cranston, East Providence, North Providence, Providence, Pawtucket, and Warwick identified a wide range of shared challenges including flooding, pollution and degraded infrastructure. A common thread in these early conversations was the lack of adequate resources to routinely maintain drainage infrastructure much less begin needed infrastructure improvements to address these challenges or meet regulatory requirements to comply with stormwater permits.

The Upper Narragansett Bay Regional Stormwater Management (UNBRSM) Initiative was convened in September 2013 to explore the creation of a regional stormwater utility as a coordinated approach that would provide a long term, sustainable solution to stormwater management for all of our communities.

This Phase I Study was structured to be the first of three phases. The primary purpose of this planning level assessment was to gather information to determine if a regional approach to funding stormwater management should be developed for the upper Narragansett Bay municipalities. Phase II will define the scope and governance of the utility, and Phase III will be implementation. The study included a Steering Committee with representatives from the study area communities and a Stakeholder Group with local representatives from various interest groups. At each phase of the study, participating municipalities will decide whether to continue along the path of implementation of a stormwater utility, either at the individual or the regional level.



The concept of a regional approach to stormwater management is not new, but it has not garnered much interest in New England until recent years. This Phase I Study is the first attempt in Rhode Island to seriously consider a regional solution to stormwater pollution, which is a watershed-based, regional problem.

Conclusions

The Phase I study drew five major conclusions:

1. The Upper Narragansett Bay region has real, growing, shared and unresolved challenges in managing stormwater.
2. With adequate resources, the expertise is available to address these challenges and the solutions would provide tangible benefits to each municipality.

3. The solutions will cost more than municipalities are now spending on stormwater management.
4. A regional approach will be more efficient and effective than an individual approach.
5. A stormwater user fee, based on how much a property contributes to stormwater run-off, is the best and fairest way to pay for the improvements.

These conclusions and the recommendations for next steps are further described below.

Stormwater Management Challenges and Opportunities in the Upper Narragansett Bay Region

The Steering Committee and the Stakeholder Group both identified numerous compelling reasons to develop a regional approach for stormwater management and funding:

- **Flooding Problems:** The Pawtuxet River, Pocasset River and Woonasquatucket River regularly flood and have significantly impacted the communities of Cranston, Warwick, Providence and North Providence. A regional program would provide for consistent flood mitigation across the region.
- **Water Quality Issues:** The Blackstone, Ten Mile, Woonasquatucket and Pawtuxet Rivers as well as Upper Narragansett Bay and Greenwich Bay all suffer water quality impacts from stormwater runoff. In order to restore the quality of these waters and protect the recreational and commercial uses that are dependent upon improved water quality, actions need to occur across the contributing watersheds that span multiple municipalities.
- **Lack of Individual Specialized Resources:** Many communities do not have trained staff or adequate resources for detailed infrastructure assessment to adequately evaluate drainage needs, conduct water quality sampling, and investigate stormwater improvements to address the environmental permit requirements. An adequately funded regional program can more cost-effectively establish in-house technical capacity or contract out for the services needed to address local needs.
- **Interconnected and Aging Infrastructure:** The drainage systems in nearly all communities are interconnected with adjacent communities and/or the Rhode Island Department of Transportation (RIDOT). Correcting a flooding or water quality problem often requires that multiple entities “fix” their system and coordination among independent departments can be very difficult. The delineation of drainage systems and combined sewer systems in the communities of Pawtucket and Providence are poorly defined and the management of this infrastructure has an impact on the Narragansett Bay Commission’s interceptors and overall operations.

Stormwater Management Funding Not Meeting Current Needs

Many municipal stormwater management programs in the region are very limited and are only able to be reactive to maintenance needs such as infrastructure repairs, street sweeping, and catch basin cleaning rather than being able to proactively address the collection system needs. Capital expenditures are limited and there is no clearly defined approach to address impaired waters.

The participating municipalities currently fund their stormwater programs through tax revenue (the general fund) with some grants and low interest loans for planning and capital projects. That means stormwater programs have to compete with other programs for funding from the general fund. There is a lack of financial and operational resources to meet environmental permit requirements. For example, the separate storm sewer system is not completely mapped, and catch basins are clogged in some communities.

Compared to other programs across the country, the level of investment in stormwater programs for a region of this size is “minimal to low.” Current annual stormwater expenditures across the region is estimated at approximately \$3.8 million. The cost estimate for future stormwater needs is in the range of \$7.8 million to \$11 million annually, but may be even higher once additional infrastructure data is available and costs for combined sanitary and storm sewer infrastructure are included.

The results of the Phase I Study indicate that initial rates under a stormwater utility would be less than \$4/month per single family residence in all communities. The national average fee is \$4.57/month and the median fee is \$3.75/month.

For the region, an average fee of \$2.75 per month per household would provide approximately \$11 million per year for stormwater management investments.

Developing a Regional Approach

After reviewing multiple options, the Project Steering Committee chose a regional stormwater management approach involving a shared responsibility approach with a new regional entity, municipal responsibilities and the Narragansett Bay Commission. The proposal will be reviewed and refined further in the Phase II study.

The new regional entity would be responsible for:

- Water quality programs,
- Municipal Separate Storm Sewer (MS4) collection systems & local flooding,
- Streams and floodplain management, and
- Program administration and collecting a uniform fee for its services, calibrated to varying local needs.

Local governments would be responsible only for development related stormwater reviews within their respective jurisdictions.

The Steering Committee proposed that the Narragansett Bay Commission would be given responsibility for all combined sewer system (CSS) infrastructure, including CSS laterals (everything up to the interceptors).

Recommendations and Next Steps

The information evaluated and discussed during the Phase I Study supports the following recommendations:

1. **Continue to explore a regional approach with a stormwater user fee.** Study participants from Central Falls, Cranston, East Providence, Providence, Pawtucket, and Warwick have agreed that there are compelling reasons to explore a regional stormwater management approach and it makes sense to continue with the Phase II Study.
2. **Pursue additional funding for the implementation of next steps.** Phase II is partially funded with \$150,000 committed from the Rhode Island Bays, Rivers and Watersheds Coordination Team. A grant application for \$500,000 was submitted to cover the remaining costs of the Phase II study as well as beginning to refine maps and identify solutions for problem areas.
3. **Engage and update stakeholders in each of the participating communities.** These meetings to present the results of the Phase I Study and develop support for next steps began at the end of the study and will continue through June 2014.
4. **Engage the current stakeholder group in additional public presentations.** Work with interested members to make presentations about the regional approach to other community leaders, including: trade associations, chambers of commerce, and other property owner groups.

1.0 Introduction and Background

The City of Providence initiated this Phase I Study (“Study”) to evaluate the feasibility of establishing a regional stormwater utility with local communities and the Narragansett Bay Commission (NBC). Interest in the concept began following the December 4, 2012 workshop “*Regional Solutions: Exploring Stormwater Utility Districts*”. Subsequently, the Phase I Feasibility Study was funded by the RI Department of Environmental Management (RIDEM) and included the following participants:

- Central Falls
- Cranston
- East Providence
- North Providence
- Providence
- Pawtucket
- Warwick
- Narragansett Bay Commission



A representative from the Rhode Island Department of Transportation (RIDOT) participated as an observer in this study, but provided input and feedback that was incorporated into this report. It is important to note that this is a preliminary study to evaluate the feasibility of a regional solution that will address the financial, operational, environmental, and management issues and needs of communities in the Upper Narragansett Bay (UNB) Watershed.

This introductory chapter provides an overview of the key objectives of the study, the Narragansett Bay Watershed, stormwater utility and regionalization concepts and some examples of regional stormwater utilities.

Key Objectives of this Phase 1 Study:

- It is the first of a three-phased initiative.
- It is a concept level assessment.
- It is an initial characterization of stormwater issues, program costs and drivers in each community.
- It explores regional framework alternatives.
- The outcome is a “go” or “no-go” decision on continuing the path of in-depth planning for a regional stormwater management and funding approach.

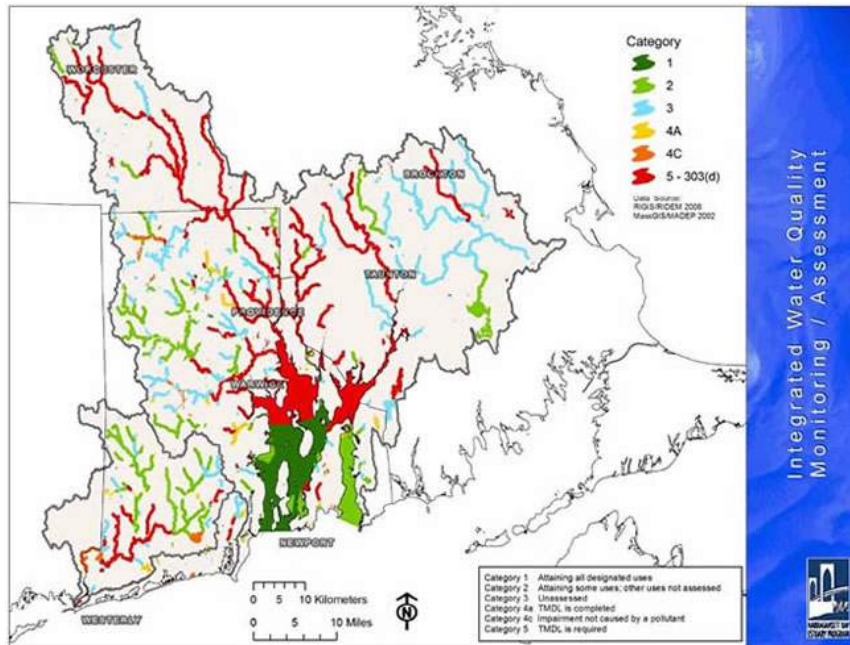
Primary Objective:
“Work with representatives from the participating communities to evaluate the feasibility of establishing a regional stormwater utility”

This Report:

- Provides an overview of water quality and stormwater management issues in the six communities in the Upper Narragansett Bay (UNB) area.
- Provides background information related to the stormwater utility concept and regional stormwater management approaches.

- Synthesizes the results of the analysis by the Project Team and information discussed at meetings with the Sustainable Stormwater Solutions Steering Committee (Steering Committee) and the Sustainable Stormwater Solutions Stakeholder Group (Stakeholder Group).
- Provides a “roadmap” to lay out the next steps for in-depth planning to support potential implementation of a regional stormwater management approach.

Narragansett Bay Watershed Overview



Narragansett Bay's 700 billion gallons of water cover 150 square miles. The watershed nurtures thousands of species of plants, fish and wildlife, and accommodates more than two million nearby residents and ten million tourists each year. It welcomes more than 100,000 fishermen each year, and over 32,000 recreational boats cruise the waters. It's annual contribution to Rhode Island's economy totals billions of dollars. Additional resource information can be

found at <http://www.dem.ri.gov/bart/nbay.htm>. The Upper Narragansett Bay and many contributing tributaries (Providence River, Seekonk River, Ten Mile River, Woonasquatucket River and Blackstone River) suffer from impacts associated with stormwater runoff and as indicated on the above watershed map are considered impaired (water bodies highlighted in red). Additional information for impaired waters and the requirements to meet the Total Maximum Daily Load (TMDL)¹ studies for each of the Study Area Communities is provided in **Appendix I**. This information is discussed further in Section 4.0.

Drivers for Change

There are multiple driving forces to enhance stormwater management and improve water quality in the UNB region.

¹ A TMDL study is an evaluation of the maximum amount of a pollutant that a water body can accept and still meet the state's water quality standards for public health and healthy ecosystems. The federal Clean Water Act requires all states to identify water bodies that do not meet state standards and develop TMDL studies for them.

From the residents’ perspective these drivers may include:

- Polluted waterways that negatively impact recreation and fishing opportunities, including beach and shellfish closures;
- Aging and inadequate stormwater infrastructure that results in flooding of streets and private property;
- Failing infrastructure that results in emergency road closures;
- River flooding that damages property and disrupts the community; and
- Erosion of stream banks and sediment deposits in fresh water streams.

From a regulatory perspective, these drivers primarily include:

- The RI Pollution Discharge Elimination System (RIPDES) Phase II General Permit for regulated Municipal Separate Storm Sewer Systems (MS4s);
- TMDL studies for waters in the UNB communities; and
- NBC’s Consent Agreement with RIDEM for the combined sewer system (CSS) in areas of Providence, Central Falls and Pawtucket.

These regulations provide a framework to address the root causes of water quality problems that encompass:

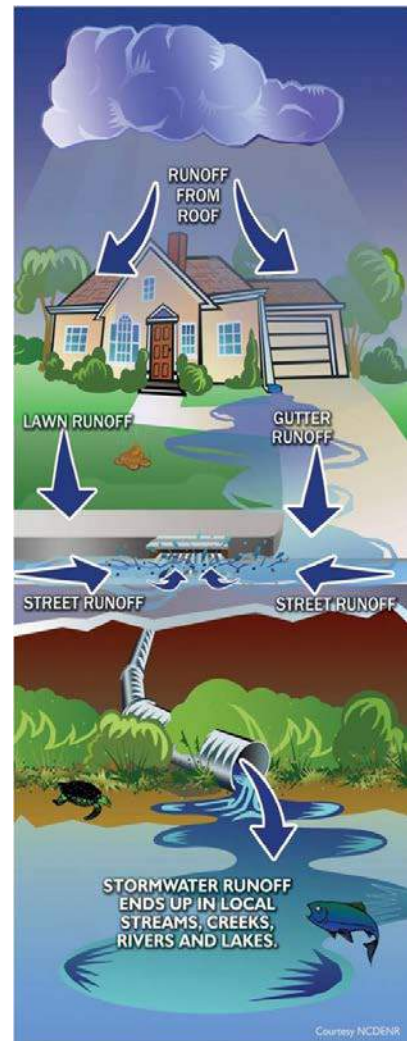
- Storm drain system operation, maintenance and rehabilitation;
- Combined sewer overflows that occur during wet weather events; and
- Inadequate infrastructure for stormwater conveyance and treatment in MS4 and CSS areas.

This information was explored in greater detail to frame the discussion of community-specific issues and the potential benefit of regionalization to address common and broader issues in the Upper Narragansett Bay Watershed.

1.1 Stormwater Utilities

A stormwater utility is seen as an umbrella under which individual communities address their own specific needs in a manner consistent with local problems, priorities and practices. A stormwater utility generally reflects three key elements:

- A funding mechanism for generating revenue – the utility is a fee for stormwater services provided;
- A program concept – the utility is a stormwater program, driven by local needs; and
- An organizational entity – the utility is a specific entity that performs stormwater services.

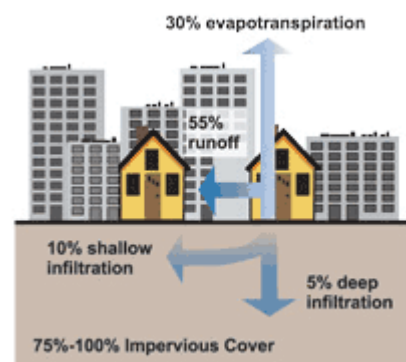


It is important when establishing a stormwater utility to determine whether the focus is on one or more of these three elements. If the only reason for the establishment of a utility is to generate a new source of revenue and to free up additional tax revenues, then that could weaken the true nexus between a user fee and the cost of providing a service. Citizen reactions could range from disappointment to anger if they are burdened with a new user fee without any commensurate enhancements in service delivery. Therefore, it is important to first define the program needs and design a better level of service (program concept) in conjunction with establishing a stormwater utility, as a funding mechanism.

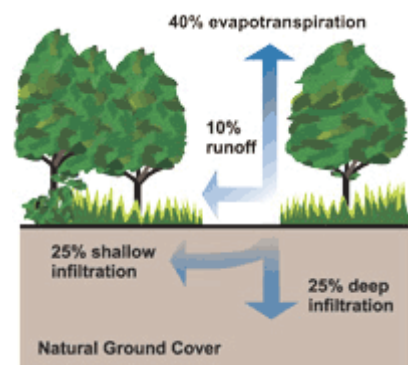
A stormwater utility is a funding mechanism for a stormwater program. Much like water and sewer utilities, an equitable fee is collected for stormwater services provided.

A Stormwater Utility Provides a Vehicle for:

- Consolidating or coordinating responsibilities that were previously dispersed among several departments and divisions;
- Generating funding that is stable, adequate, equitable and dedicated solely to the stormwater function; and
- Developing programs that are comprehensive, cohesive and consistent year-to-year.



Similar to a wastewater or water supply system, a stormwater utility is based on the premise that the stormwater drainage system is a public system. When a user places a demand on either of these two other systems, the user pays a service fee that is reasonably aligned with the demand. In the case of stormwater, when a natural area is paved, it contributes a greater volume of runoff to the drainage system; thus, imposing a demand on the system. The greater the demand (i.e., the more the parcel of land is paved), the greater the user fee should be.



Source: US EPA Fact Sheet 841-F-03-003

Key Advantages of a Stormwater Utility are:

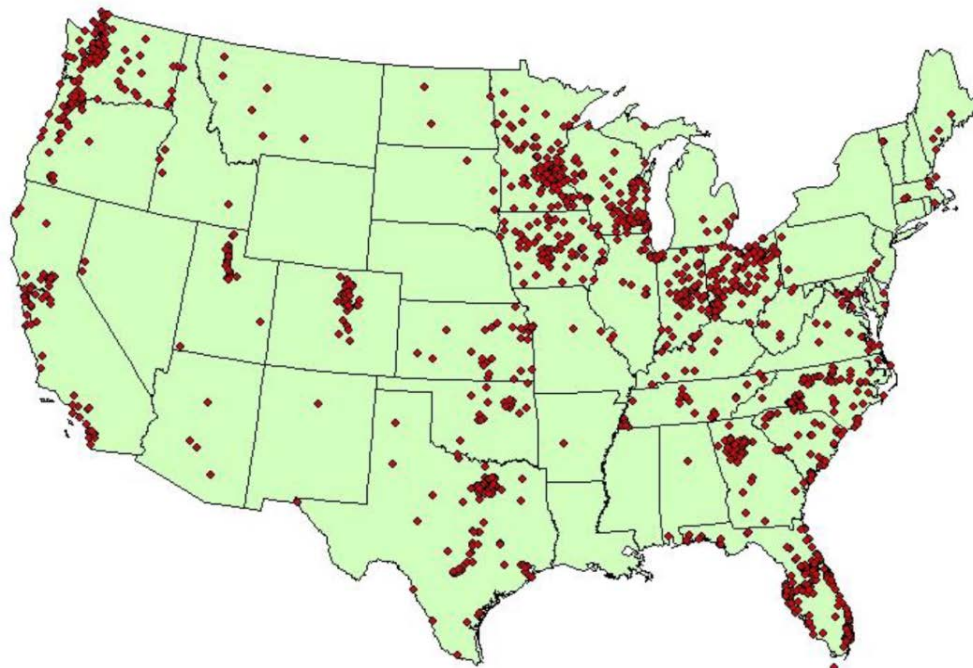
- **It is Stable** because it is not as dependent on the vagaries of the annual budgetary process as taxes are.
- **It is Adequate** because a typical stormwater fee is based on a well thought out stormwater program to meet the needs and demands of the community, as well as other program drivers (e.g., water quality, regulations).
- **It is Flexible** because fees can be structured in multiple ways, and the program can be managed to fund activities based on changing priorities and needs.
- **It is Equitable** because the cost is borne by the user on the basis of demand placed on the drainage system.

Since stormwater management cannot compete effectively for general fund tax dollars, most local governments find that only legally dedicated revenue will stand the test of time and succeed in addressing competing priorities.

According to the Western Kentucky University 2013 Stormwater Utility Survey:

- There are over 1,400 stormwater utilities in 39 states across the country² and in these communities, the average population is 73,900 and the median is 19,200.
- The average fee for a single family residence is \$4.57/mo and the median fee is \$3.75/mo.

Figure 1.1 Existing Stormwater Utilities (source: Campbell, C. Warren, 2013)



1.2 Enabling Legislation for Stormwater Utilities

Stormwater utilities can be established in Rhode Island under RIGL Title 45, Chapter 45-61, known as the Rhode Island Stormwater Management and Utility District Act of 2002. A copy of RIGL 45-61 is provided in **Appendix II**. RIGL 45-61 authorizes the “*cities and towns of the state to adopt ordinances creating stormwater management districts (SMD), the boundaries of which may include all or part of a city or town, as specified by such ordinance. Such ordinances shall be designated to eliminate and prevent the contamination of the state's waters and to operate and maintain existing stormwater conveyance systems.*” Since no stormwater utilities have been established in Rhode Island, there are no example ordinances or related legal cases.

² The Western Kentucky University survey captures data for known stormwater utilities nationwide based on information that is readily available and various other sources. As noted in the 2013 study and based on AMEC’s experience, there are likely closer to 2,000 stormwater utilities in the U.S.

However, a draft ordinance was recently developed for the Town of Middletown, RI and there are several example ordinances from other stormwater utilities in New England.

It is important to remember that a stormwater utility ordinance is one of the final steps for implementing a stormwater utility, but the ordinance relies upon numerous policy decisions that need to be thoroughly vetted during the due diligence process described at the end of Section 1.3. Stormwater utility legal challenges have occurred in nearly every state and the court's decision always comes down to a matter of whether a due diligence process was followed and the supporting rationale for developing the utility. This Phase I Study did not include an analysis of the legal framework for a regional stormwater utility, but it is important to note that the enabling legislation appears to support regionalization. The Conservation Law Foundation recently completed an analysis of RIGL 45-61 and this information is provided in Appendix II for reference.

1.3 Regional Stormwater Utilities

Regional stormwater management and funding approaches are generally formed when there are common drivers and economies of scale/efficiency to be gained. A regional approach to managing stormwater can take on several different forms based on the needs of the participating communities in the Upper Narragansett Bay region. First, it is important to consider the phrase “regional” from a program, organization, and funding perspective:

- **Regional Program:** “we share common elements to address local and regional needs”
- **Regional Organization:** “our administration is cooperative and our mission is clear”
- **Regional Funding:** “our funding approach looks similar and saves cost”

Regional stormwater utilities can have varying authority, purpose and structure. **Table 1.1** illustrates the range of governance/administration and funding options for a regional stormwater management and funding approach.

Table 1.1 Variations in Regional Stormwater Management and Funding Approaches

Regional Approaches	Independent Funding	Each Has Similar Fee Structure	Utility & Fee*
Independent Programs	Move ahead independently	Gain economies in fee development only	Create an organization to collect and disburse funds only
Cooperative Multi-Municipal Programs	Each decides how to pay for partially cooperative program	Cooperate on similar fee and shared program where it makes sense	One “look” to citizens with cooperation in parts of program
Regional Umbrella Program	Each decides how to pay its fair share of a single regional program	Avoid financial entanglement but gain economies of scale	Each gives program and authority to separate entity

*Fees still may be different among the participating municipalities

Advantages and Disadvantages of a Regional Stormwater Program

In order for municipalities to achieve the efficiencies available through regional stormwater programs, each community must be willing to relegate some local authority and ownership to the regional effort. However, municipalities may be reluctant to participate in a regional effort because of the perception that:

- Their constituents' money may be spent on projects outside their jurisdiction;
- Uncooperative regional members may threaten compliance with permits;
- Administrative costs may be too high to coordinate a regional effort and to create a new organization;
- A new "bureaucracy" is being created;
- There will be a potential loss of asset ownership;
- They will lose decision making and adequate response to local needs; and/or
- They will lose control over priority setting.

However, regional programs can be created with great flexibility, tailored to the participating municipalities' needs and the level of cooperation with which they are comfortable. As with all regional planning efforts, individual municipalities must sacrifice some control to the larger community or authority in order to achieve long term gain. Possible advantages include:

- Economies of scale when performing services and pursuing contracts for services such as monitoring, street sweeping and specialized stormwater management expertise;
- Greater access to sources of specialized expertise;
- Ability to direct resources to projects watershed-wide that will have greater benefits to water quality and flooding, for example;
- Costs are spread across a larger rate payer base;
- Increased ability to gain outside funding (i.e., state and federal grants);
- Consistency of programs at a watershed level – across jurisdictions;
- Ability to address more complex problems;
- More stable organizational structure that is less influenced by politics and elections; and
- Consistency in services across watersheds.

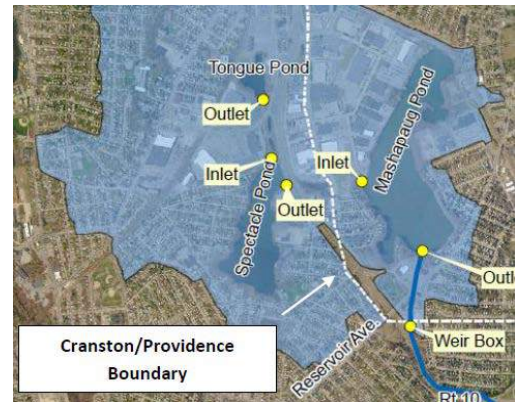
Specific to the Upper Narragansett Bay communities, the following examples highlight the advantages of a regional stormwater program:

- **Flooding Problems:** the Pawtuxet River, Pocasset River and Woonasquatucket River regularly flood and have significantly impacted the communities of Cranston, Warwick, Providence and North Providence. Flooding is a regional issue that knows no political boundaries and requires significant resources for flood protection and mitigation. A regional program would provide for consistent flood mitigation across the region.



Photo courtesy of the Warwick DPW

- Water Quality Issues:** the Blackstone, Ten Mile, Woonasquatucket and Pawtuxet Rivers as well as Upper Narragansett Bay and Greenwich Bay all suffer water quality impacts from stormwater runoff. In order to restore the quality of these waters and protect the recreational and commercial uses that are dependent upon improved water quality, actions need to occur across the contributing watersheds that span multiple municipalities. Freshwater ponds in the area are also affected. For example, the Roger Williams Park Ponds experience excessive algal growth and routine cyanobacteria blooms due to phosphorous primarily from stormwater runoff. Close to half of the phosphorus comes from the upper watershed (Tongue Pond, Spectacle Pond and Mashapaug Pond) located in Cranston and Providence – all of which experience similar water quality problems. Improvements to these ponds can only be addressed through a regional watershed-based management approach.
- Lack of Individual Specialized Resources:** many communities do not have trained staff or adequate resources for detailed infrastructure assessment to adequately evaluate drainage needs, conduct water quality sampling, and investigate stormwater improvements to address the RIPDES MS4 permit and TMDL requirements. An adequately funded regional program can more cost-effectively establish in-house technical capacity or contract out for the services needed to address local needs.
- Interconnected and Aging Infrastructure:** the drainage systems in nearly all communities are interconnected with adjacent communities and/or the Rhode Island Department of Transportation (RIDOT). Correcting a flooding or water quality problem often requires that multiple entities “fix” their system and coordination among independent departments can be very difficult. The delineation of drainage systems and combined sewer systems in the communities of Pawtucket and Providence are poorly defined and the management of this infrastructure has an impact on the Narragansett Bay Commission’s interceptors and overall operations.



Source: Restoring the Ponds in Roger Williams Park, Horsley Witten Group, October 2013

Additional feedback from the Steering Committee and Stakeholder Group regarding the pros and cons of a regional stormwater program is discussed further in Section 4.1.

Examples of Regional Stormwater Utilities

Regional stormwater utilities across the country provide examples of what can be done and how one can be managed on a regional basis. Some national and local models are discussed below to provide some perspective. The Louisville, Kentucky Metropolitan Sewer District (MSD) is a regional entity that provides the following core services throughout the Louisville Metro:



- Wastewater Collection and Treatment (270,000 accounts)
- Stormwater Drainage and Management (376 mi² area)
- Flood Protection (Ohio River)

Under the stormwater program, the Louisville MSD's responsibilities begin at the bottom of the catch basin and continue to the stream systems. Small communities were required to participate in the program under state law and large communities have a choice to be part of the cooperative program. <http://www.msdlouky.org>

Other Regional Stormwater Utilities Include³ . . .



While Not the Same, Similar New England Examples Include . . .



The Long Creek Watershed Management District (LCWMD) was created by interlocal agreement among the municipalities of South Portland, Portland, Westbrook and Scarborough, Maine to create a collaborative organizational structure with public entities and private businesses to implement the Long Creek Watershed Management Plan. The program focuses on restoration of the stream and 3.45 mi² watershed using cost-effective strategies that are funded by a fee of \$3,000/year for each acre of impervious area on properties with at least one acre of total impervious area. <http://www.restorelongcreek.org>

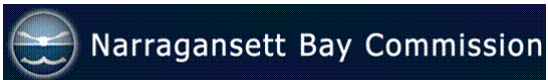


The Central Massachusetts Regional Stormwater Coalition (CMRSWC) was originally formed by a group of 13 communities working together to address municipal stormwater management. Today,

30 communities have joined the CMRSWC, participating in collaborative planning efforts for surface water resource protection and to meet the requirements of the EPA NPDES MS4 Permit efficiently and cost-effectively. The CMRSWC was originally funded by a Community Innovation Grant by the Massachusetts Executive Office of Administration and Finance. Although the CMRSWC is not a legal entity that collects a fee, it is an example of a regional approach to stormwater management to maximize the benefit and efficiency of activities across numerous communities. <http://centrilmastormwater.org>

³ On September 26, 2013, the Ohio Eight District Court of Appeals ruled against the Northeast Ohio Regional Sewer District in finding that the Sewer District had no authority under R.C. Chapter 6119 or its Charter to enact its Regional Stormwater Management Program or said fee. The ruling can be found at <http://www.supremecourt.ohio.gov/rod/docs/pdf/8/2013/2013-ohio-4186.pdf> and readers are encouraged to review the entire document, including the discussion from Larry A. Jones, SR., PJ. and testimony from non-appealing member communities in favor of the Regional Stormwater Management Program. The Sewer District appealed to the Ohio Supreme Court and the appeal was accepted, but a hearing schedule has not been established yet.

Local (Rhode Island) Regional Example



Narragansett Bay Commission

Although it is focused solely on wastewater transmission and treatment, the most familiar example of a regional entity is the Narragansett Bay

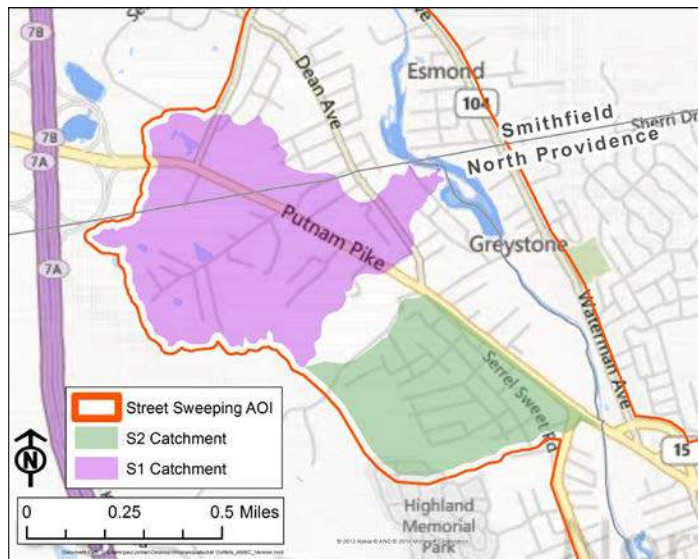
Commission (NBC). The NBC's mission is to "maintain a leadership role in the protection and enhancement of water quality in Narragansett Bay and its tributaries by providing safe and reliable wastewater collection and treatment services to its customers at a reasonable cost." The NBC's service area encompasses the metropolitan Providence and Blackstone Valley areas, which include Providence, North Providence, Johnston, Pawtucket, Central Falls, Cumberland, Lincoln, the northern portion of East Providence and small sections of Cranston and Smithfield. The service area incorporates the combined sewer system (CSS) for stormwater and sanitary sewer in areas of Providence, Central Falls and Pawtucket.

See Section 4.1 for a more detailed discussion of the regional approaches evaluated as part of this study.

It should be noted that this Phase I Feasibility Study considered the NBC in the context of a regional stormwater management and funding approach based on the physical infrastructure (i.e., CSS) and interrelationship of the study communities.

Woonasquatucket River Watershed, Coordinated Maintenance Operations

In 2013, staff from RIDEM, RIDOT and the communities of Johnston, North Providence, Providence and Smithfield developed a collaborative street sweeping and catch basin cleaning program for priority areas in the Woonasquatucket River Watershed. The effort was part of the "Excellence in Bay Management – Coordinated Maintenance Operations in the Woonasquatucket" and was intended to clean the storm drain infrastructure to facilitate detailed inspections and mapping by RIDEM interns. However, the exercise also demonstrated that a collaborative effort among multiple entities is an effective strategy to accomplish watershed management goals with limited existing resources. This was an informal process/agreement where municipal operators and agency staff agreed to take responsibility for specific maintenance activities where it made sense with local resources. For example, staff marked up maps and



Source: RIDEM GIS Department

created logical street sweeping routes that incorporated state and local roads to maximize the use and effectiveness of crews.

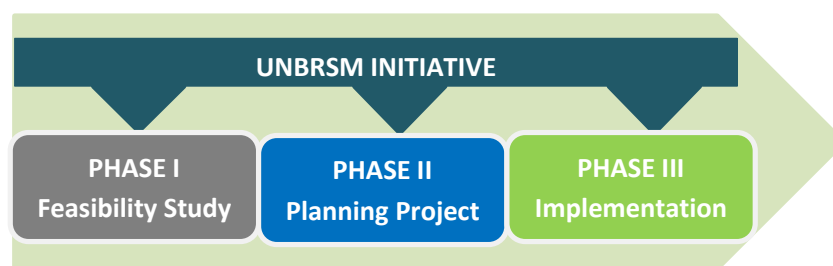
A summary of the priority maintenance areas and assignments is provided below.

- RIDOT: drainage along Woonasquatucket Ave (across from Chandler St, N. Prov.)
- Johnston: around Putnam Pike (Anglewood/Mowry/Scenery/Serrel Sweet)
- North Providence: southwest of Centerdale Ave & Fruit Hill Ave to Woon River
- Providence/Johnston: catchbasins/Drainage in Mancini Drive catchment area
- Providence: south of Route 6 in Mancini Drive catchment area; Atwells/Harris/Valley/Promenade
- Smithfield: north of Putnam Pike around Esmond/Dean/Waterman

Considerations for Regionalization

It is important to note that the **Rhode Island Stormwater Management and Utility District Act of 2002** allows municipalities to create stormwater management and utility districts separately or with other municipalities in order to “eliminate and prevent the contamination of the state’s waters and to operate and maintain existing stormwater conveyance systems.” While the enabling legislation appears to support regionalization, there are numerous elements and considerations in developing a regional stormwater management and funding (utility) approach. This Phase I Feasibility Study was structured to be the first of three-phased Upper Narragansett Bay Regional Stormwater Management (UNBRSM) initiative, as illustrated in **Figure 1.2**.

Figure 1.2 Phased Approach for the Upper Narragansett Bay Regional Stormwater Management (UNBRSM) Initiative



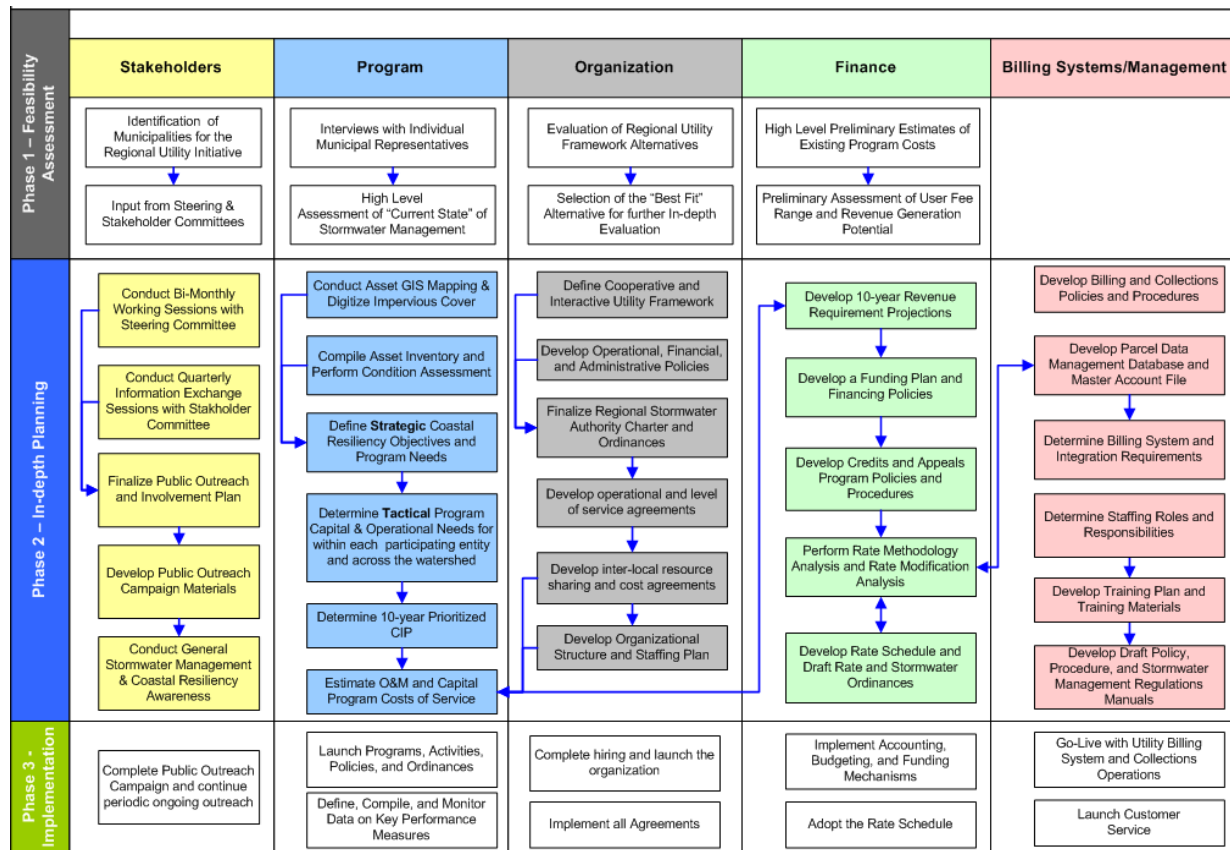
These phases build across a framework that follows the five distinct “tracks”, as described below, that need to be thoroughly vetted through a due diligence process:

- **Stakeholders:** Involves all activities pertaining to engaging internal and external stakeholders, and activities associated with the broader public/rate payer education and outreach.
- **Program:** Involves both strategic and tactical activity components ranging from program planning and prioritization to in-depth asset inventory development and mapping.
- **Organization:** Involves defining all activities that relate to policy, legislation, inter-governmental agreement issues and organizational authority, staffing and structure.

- **Finance:** Involves financial planning including funding strategies and rate structure, and defining all aspects of accounting, budgeting, and financing processes.
- **Billing Systems / Management:** Involves activities that relate to defining parcel data management and billing systems, and developing draft manuals, regulations, and business processes.

Figure 1.3 provides an overview of the three-phased UNBRSM Initiative and the key activities across each “track” that are associated with each of the three phases.

Figure 1.3 Key Activities by Phase for the UNBRSM Initiative



1.4 Phase I Study Approach

This study was completed by a Project Team consisting of representatives from RIDEM, the City of Providence and a group of consultants. In addition, the project involved two external stakeholder groups, a Steering Committee composed of municipal representatives, and a Stakeholder Group comprising of citizen and special interest group representatives. The Project Team worked with members of the Steering Committee and Stakeholder Group to consider and evaluate a variety of topics according to the following Scope of Work:

- Task 1 – Facilitation of Sustainable Stormwater Solutions Steering Committee: 4 meetings

- Task 2 – Facilitation of Stormwater Stakeholder Group: 3 meetings
- Task 3 – Analysis of Local Stormwater Programs
- Task 4 – Exploration of Regional Stormwater Management Alternatives
- Task 5 – Roadmap for Implementation, Upper Narragansett Bay Regional Stormwater Utility
- Task 6 – Phase I Feasibility Report
- Task 7 – Briefing Material and PowerPoint for Local Elected Officials (pending)
- Task 8 – Presentation to Local Officials (pending)

The list of the Project Team members and a more detailed discussion of each of the above tasks are provided in **Appendix III**.

1.5 Steering Committee

The Project Team worked with the participating municipalities to establish a Sustainable Stormwater Solutions Committee (Steering Committee). The members of the Steering Committee represent the participating municipalities, and were designated by the Mayor or City/Town Manager of each participating municipality, as well as the Narragansett Bay Commission. The Steering Committee members generally consisted of technical staff involved in stormwater management activities and/or financing of municipal programs. Therefore, these members met separately from the community-based Stakeholder Group based on their level of engagement and technical expertise related to the project. It should be noted that a representative from the Rhode Island Department of Transportation (RIDOT) participated as an observer with the Steering Committee.

The Steering Committee provided direction during the feasibility study process and reviewed the final recommendations and Phase I Feasibility Report. Steering Committee members were also responsible for communication to and from their respective department and/or board chairs. Copies of the Steering Committee meeting agendas, presentations and meeting summaries are provided in **Appendix IV**.

Table 1.2 Sustainable Stormwater Solutions Steering Committee

Name	Affiliation
Elaine Partridge	Central Falls - Director of Public Works & Code Enforcement
Marie Twohey	Central Falls - City Clerk
Ken Mason	Cranston - Director of Public Works
Ed Tally	Cranston - Environmental Program Planner
Erik Skadberg	East Providence - City Engineer
Louis Lanni	North Providence - Administrative Assistant to the Mayor
Lance Hill	Pawtucket - Director of Public Works
Andrew Silvia	Pawtucket - Chief of Project Development

Name	Affiliation
Bill Bombard	Providence - Acting Director of Public Works
Josh O'Neill	Providence - Emergency Management Agency Recovery Coordinator
Dave Everett	Providence - Principal Planner
Eric Earls	Warwick - Engineering Division
Eric Hindinger	Warwick - Engineering Division
Ray Marshall	Narragansett Bay Commission - Executive Director
Tom Uva	Narragansett Bay Commission - Director of Planning, Policy & Regulation

During Steering Committee Meeting #1, the members provided the following thoughts regarding what they hoped to get out of the process and what concerns they had at the outset.

Education and Involvement

- Create an ability to explain this to political leadership
- Create an ability to explain the benefits even to local municipalities that are facing financial hardship
- Define long term benefits and short term costs in an attractive and real way
- Be able to quantify the financial gap in simple clear terms
- Understand and be able to speak to the public perceptions and natural opposition to new fees
- Be able to differentiate between sewer and stormwater fees, and fees and taxes
- Understand the value of past investments – and the return on investment going forward

Cooperation

- Facilitate cooperation among communities
- Create realistic expectations or objectives, costs and time frames
- Define a geographic size or membership for the group that is realistic
- Define an approach wherein a single entity cannot stall progress
- Define a realistic and helpful state role
- Define a realistic and helpful RIDOT role
- Ensure we gain efficiencies through cooperation

Program

- Take full advantage of experiences elsewhere
- Insure all stormwater needs are met, not just water quality (e.g., FEMA)

This was only the group's initial reaction to and understanding of the project and process, but it provides a good sense of the topics and issues that need to be addressed moving forward with the broader public. This information is revisited in Section 3.3 to discuss the overall message for an enhanced stormwater management program and regional approach.

1.6 Stakeholder Group

A Stakeholder Group was established to provide a broader perspective and ensure that the larger community of interests was informed of the feasibility study process. Members of the Stakeholder Group represented residents, businesses, developers, labor, academic institutions, health professionals, community and environmental organizations, and other non-profits to review the implications of creating an enhanced stormwater program with a sustainable revenue source. Copies of the Stakeholder Group meeting agendas, presentations and meeting summaries are provided in Appendix IV.

The formation of the Stakeholder Group was led by the City of Providence and RIDEM with input from the Project Team and Steering Committee to invite a diverse group of potential stakeholders. The invitation and list of stakeholders invited is provided in Appendix IV. **Table 1.3** represents the stakeholders that participated in the Phase I Feasibility Study.

Table 1.3 Stormwater Stakeholder Group

Name	Affiliation
Mark Van Noppen	Armory Revival Company
Jonathan Ford	Blackstone Park Conservancy
Meggie Patton	Brown University
Kurt Teichert	Brown University
Lauren Carson	Clean Water Action
Jamie Rhodes	Clean Water Action
Scott Duhamel	Construction and Building Council
Len Bradley	DiPrete Engineering
Meg Kerr	Environment Council of RI/Blueways Alliance
John Sinnott	Gilbane Building Company
Beshka Kendell	Groundwork Providence
Sheri Lupoli	Groundwork Providence
Marcus Mitchell	Mt. Hope Neighborhood Association
Harold Gadon	NBC Citizens Advisory Committee
Gale Gennaro	Providence College
Dave Caldwell, Jr.	RI Builders Association
Bob Vanderslice	RI Department of Health
Marc Petrowicz	RI Nursery & Landscape Association
Shannow Brawley	RI Nursery & Landscape Association
Topher Hamblett	Save the Bay
Barnaby Evans	Waterfire

2.0 Current Stormwater Programs

This section provides a description of the stormwater management programs within the Upper Narragansett Bay (UNB) study area. A brief description of the region is provided below followed by the data provided by each of the municipalities and a summary of the data analyzed. Information was requested and obtained through a survey (see **Appendix V** for template), one-on-one interviews and follow-up telephone conversations.

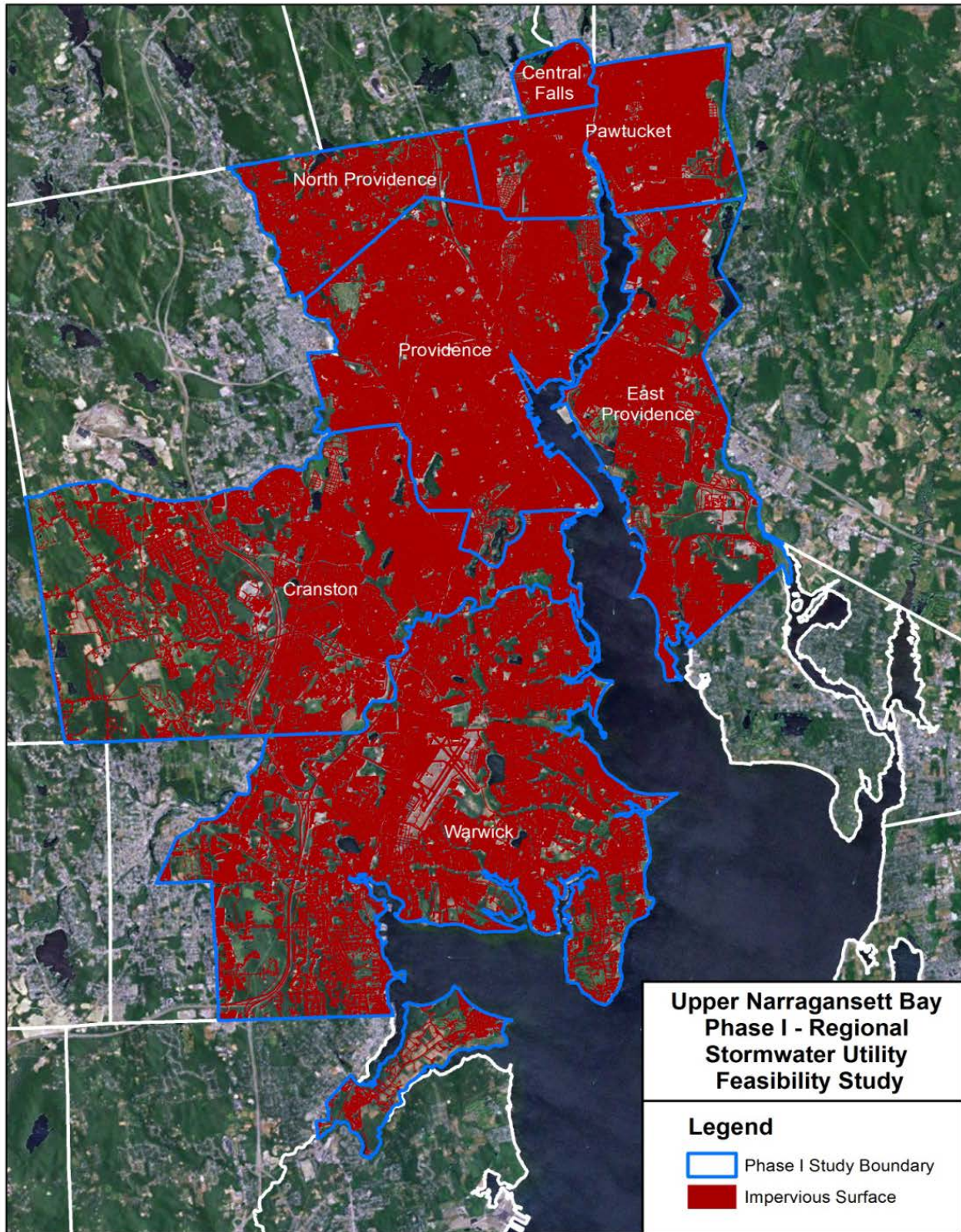
2.1 Regional Overview

For the purpose of this study, the UNB study area is defined as the following: Central Falls, Cranston, East Providence, North Providence, Pawtucket, Providence and Warwick. The UNB study area is home to approximately 510,740 residents and covers an area of nearly 113 square miles that drains to the Narragansett Bay, as illustrated in **Figure 2.1**. Water quality monitoring within the Upper Narragansett Bay Watershed shows that a number of streams and other water bodies are listed as impaired. In accordance with the Federal Clean Water Act, RIDEM is required to develop water quality restoration plans, known as **Total Maximum Daily Load (TMDL) studies** for waters identified as impaired. A TMDL describes the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. These water quality restoration plans identify corrective actions necessary to improve water quality and restore designated uses (e.g., swimming, shellfishing, drinking water).

Additional information regarding the impaired waters for each of the participating municipalities and TMDL study requirements is provided in Section 3.1 and Appendix I. To date, the RI Department of Environmental Management has completed the following TMDL studies for waters that are located partially or wholly within one or more of the participating municipalities:

- Blackstone River
- Greenwich Bay and Watershed
- Mashapaug Pond
- Runnins River
- Ten Mile River
- Woonasquatucket River
- Eutrophic Ponds (includes five urban ponds in Cranston, Providence and Warwick)
- Statewide Bacteria TMDL (includes several rivers and ponds in the study area):
 - Moshassuck River (Pawtucket & Central Falls)
 - West River (North Providence & Providence)
 - Meshanticut Brook (Cranston & Warwick)
 - Simmons Brook (Cranston)
 - Roger Williams Park Ponds (Providence)
 - Mashapaug Pond (Providence)

Figure 2.1 Upper Narragansett Bay Phase I Study Area



The impacts of stormwater runoff on water quality, as well as flooding, are primarily associated with impervious surface and have become a significant concern at the local and national level. Stakeholder awareness of water quality and stormwater management issues can vary significantly and it takes a focused, collaborative effort to recognize the needs and develop a plan for improvement.

However, there are existing regulations that provide a framework for improving water quality. In Rhode Island, municipal stormwater discharges are regulated through Municipal Separate Storm Sewer System (MS4) permits under the Rhode Island Pollutant Discharge Elimination System (RIPDES), as authorized by the Federal Clean Water Act. Rhode Island is a “delegated” state and therefore oversight of this MS4 permit is the direct responsibility of the Rhode Island Department of Environmental Management and not Region I of the U.S. Environmental Protection Agency (US EPA).

Permit requirements may be a driver for improvement; however, there are many reasons to change the stormwater management status quo. (see Section 3.0)

The municipalities in the study area have been managing their stormwater programs under the initial MS4 permit issued in 2003, which expired in 2008 and has yet to be reissued. As a “delegated” state program, RIDEM’s permit must include or adequately address requirements contained in the US EPA’s permit. Based upon the draft MS4 permits issued by US EPA Region 1, the re-issued permit is expected to include a substantial increase in responsibilities and costs for stormwater management, such as:

- **Enhance the operation and maintenance** of the storm drain system (e.g. mapping entire drainage systems) such that it functions as originally designed to maximize the removal of pollutants;
- **Develop a better understanding** of the storm drain system, causes of water quality impacts and options for mitigation or improvement; and
- **Implement stormwater BMPs** to address impaired waters and meet the requirements of TMDL studies within established time frames.
- **Undertake public outreach and education efforts** to enhance the awareness of stormwater issues to mitigate pollution and garner public support for stormwater management.

Study Area Characteristics

The analysis by the Project Team identified the following characteristics for the study area:

- **Programs:**
 - Many municipal programs are very limited with reactive maintenance of the collection system for both the CSS and MS4 systems. These activities include street sweeping and catch basin cleaning.
 - Capital expenditures are limited and there is no clearly defined approach to address impaired waters and TMDLs.

- Understanding of the CSS and MS4 program needs is limited in some communities.
- **Systems (see Table 2.1):**
 - In some communities, the CSS and MS4 collection areas are complex, interspersed and poorly defined.
 - Some communities have separate MS4 and sanitary sewer systems.
 - MS4 collection areas range from limited systems with 2 outfalls (Central Falls) to extensive systems with up to 800 outfalls (Warwick).

Table 2.1 Summary of Study Area MS4 & CSS System Characteristics

Municipality	MS4	CSS	MS4 Outfalls	Total Catch Basins & Manholes*	MS4 Catch Basins & Manholes (estimated)
Central Falls	2.8%	97.2%	2	1,158	32
Cranston	100%	0%	549	7,222	7,222
East Providence	100%	0%	130	4,468	4,468
North Providence	100%	0%	49	780	780
Pawtucket	16.8%	83.2%	49	6,000	1,008
Providence	31.7%	68.3%	175	16,000	5,072
Warwick	100%	0%	800	4,000	4,000
Totals	-	-	1,757	39,628	22,582

Notes: *Total includes catch basins, manholes, curb inlets and drywells.

The figures for the percent CSS in Central Falls, Pawtucket and Providence were obtained from the February 16, 1994 Concept Design Report by Louis Berger & Associates, Inc., prepared for the Narragansett Bay Commission. A table and figure of the separated sewerage areas from the 1994 report are provided in **Appendix VI** for reference. Based on discussions with these communities and the NBC, these figures appear to be accurate but need to be verified.

- **Funding:**
 - Municipalities currently fund their stormwater programs through tax revenue (general fund) with some grants and low interest loans for planning and capital projects.
 - There is a lack of financial and operational resources to meet MS4 requirements. For example, the MS4 is not completely mapped and catch basins are clogged in some communities.
 - Stormwater programs have to compete with other programs for funding from the general fund.
 - The level of investment in stormwater programs for a region of this size is “minimal to low” when compared to other programs across the country.
 - The sanitary sewer collection systems are funded differently among communities – some funded through the general fund and others through a user fee based enterprise fund.

Summary of Characteristics & Current Stormwater Program Budgets

Table 2.2 summarizes some of the characteristics by municipality that are discussed further in subsequent sections of this report. It is worth noting that there are significant differences in demographics, land area and land use across the communities in the study area. This information needs to be considered in a regional stormwater management approach to balance needs, level of service and equity.

Table 2.2 Summary of Study Area Characteristics

Municipality	Population	Land Area (mi ²)	Density (people/mi ²)	Impervious Area (acres)	Impervious Area (%)	Current Budget Est.*
Central Falls	19,376	1.3	14,905	548	66.4%	\$56,168
Cranston	80,387	28.9	2,782	6,067	32.8%	\$1,354,073
East Providence	47,037	14.0	3,360	3,292	36.9%	\$275,400
North Providence	32,078	5.8	5,531	1,667	44.9%	\$117,847
Pawtucket	71,148	8.7	8,178	3,481	61.4%	\$135,743
Providence	178,042	18.3	9,729	7,672	63.8%	\$1,346,343
Warwick	82,672	35.9	2,303	7,931	34.5%	\$541,312
Totals	510,740	112.9		30,658		\$3.8M

Data Sources: 2010 U.S. Census (population) and State of Rhode Island Office of GIS (impervious area).

*Current budget estimate is for the stormwater program only and does not include the cost to manage infrastructure in CSS areas.

The current stormwater program cost was estimated based on budget categories for labor, materials and equipment across multiple City departments. In most cases, the study area communities do not have detailed budgets for activities specifically related to stormwater management due to the current de-centralized management structure that is typical for these programs. Therefore, costs were estimated based on an evaluation of budgets and allocation of stormwater-related costs by the Project Team and community staff.

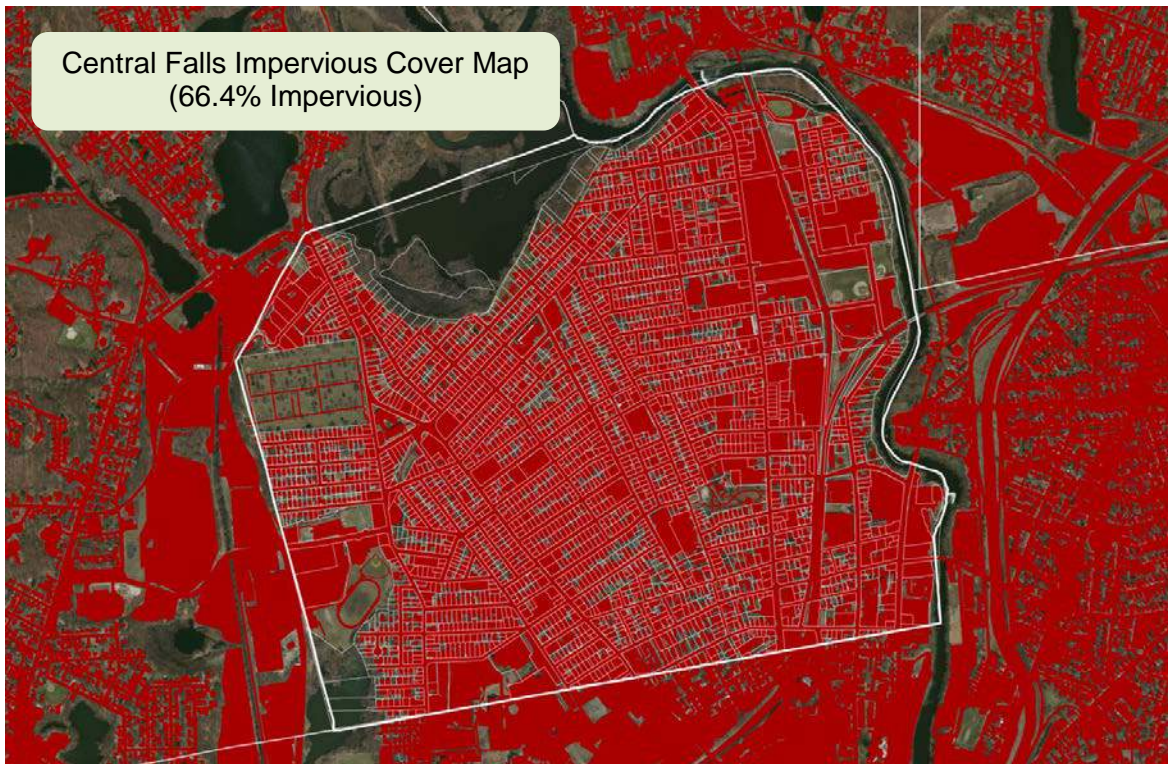
It is important to note that the current stormwater program level of service varies in each community and the communities of Providence and Pawtucket have combined sewer systems that serve approximately 68% to 83% of each City. Additionally, it appears that 97.2% of Central Falls is served by a combined sewer system. Section 4.2 discusses the need to operate and maintain the CSS, which will result in an additional cost for this infrastructure. The NBC and CSS communities indicate that the level of service for this infrastructure is not sufficient and additional funding is needed.

Table 2.3 summarizes the current stormwater program costs by major cost center to be consistent across the study area. Refer to the survey in Appendix V for the cost template that was used to evaluate current expenditures during the one-on-one interviews and subsequent conference calls with staff from each community. Costs are presented for each community with assumptions in Sections 2.2 through 2.8.

Table 2.3 Summary of Current Budgets by Cost Center for Study Area (2014)

Key Cost Center	Totals	Central Falls	Cranston	East Providence	North Providence	Pawtucket	Providence	Warwick
Administration	\$138,381	\$7,524	\$23,504	\$15,000	\$15,000	\$795	\$70,129	\$6,429
<i>Indirect cost allocation (20%)</i>	\$637,315	\$8,861	\$225,679	\$45,900	\$19,641	\$22,624	\$224,390	\$90,219
Operations & Maintenance	\$1,951,409	\$36,783	\$536,551	\$157,000	\$70,750	\$62,532	\$899,112	\$188,681
Engineering & Master Planning	\$325,322	\$ -	\$8,481	\$37,000	\$ -	\$16,893	\$107,262	\$155,687
Regulation/ Enforcement	\$72,371	\$ -	\$9,858	\$ -	\$ -	\$7,399	\$45,450	\$9,663
Capital Improvement Projects*	\$664,934	\$ -	\$550,000	\$ -	\$ -	\$25,500	\$ -	\$89,434
<i>Major Capital Projects</i>	\$337,434	\$ -	\$300,000	\$ -	\$ -	\$ -	\$ -	\$37,434
<i>Minor Capital Projects</i>	\$327,500	\$ -	\$250,000	\$ -	\$ -	\$25,500	\$ -	\$52,000
Water Quality Monitoring	\$34,156	\$ -	\$ -	\$20,500	\$12,456	\$ -	\$ -	\$1,200
Totals	\$3,823,887	\$53,168	\$1,354,073	\$275,400	\$117,847	\$135,743	\$1,346,343	\$541,313

2.2 Central Falls



The City of Central Falls is approximately 1.3 square miles in area. The City is mostly composed of dense residential, industrial and commercial areas. **Table 2.4** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.4 Land Use in Central Falls

Land Use Type	Percent Coverage in Central Falls
High Density Residential	30.1%
Industrial	19.3%
Commercial	15.4%
Water	11.9%
Wetland	7.8%
Railroad Facilities	6.5%
Institutional	2.8%
Deciduous Forest	1.8%
Cemeteries	1.5%
Developed Recreation	1.4%
Other	1.5%

Leadership/Governance: Central Falls currently operates under a Mayor and City Council form of government. The current mayor is James A. Diossa and the City Council has five members each from one of five City wards. The Council is composed of a president, claims committee chair, pro tempore and two other members.

Population: According to the Rhode Island Department of Labor and Training the 2000 census reported a population of 18,928 and the 2010 census reported a population of 19,376 marking a 2.4% percent increase in population over the ten year span.

Economic Condition: The State of Rhode Island categorizes the City of Central Falls as a financially depressed community. This status is assigned when a community has an average income less than 80% of the average income of the state. The City declared bankruptcy in 2011 and is currently operating under a five year recovery plan.

Key Industry: The largest employers in Central Falls include Murdock Webbing Company, Osram Sylvania and Fuller Box, making manufacturing (textiles, lighting and packaging) the leading industry.

2.2.1 Stormwater System & Local Issues

As discussed previously, it appears that approximately 97.2% of Central Falls is served by a gravity fed combined sewer system with approximately 1,158 structures that are treated by the NBC's Bucklin Point Wastewater Treatment Facility (WWTF) in East Providence. Central Falls has been unable to identify a separate MS4 discharge and all drainage is believed to discharge to the CSS and NBC interceptors. The 2.8% MS4 drainage area in Central Falls appears to be associated with CSO Outfalls 106 and 107, which allow some or all of the separated drainage areas to normally discharge through the CSO outfalls. In other words, CSO Outfalls 106 and 107 also serve as MS4 outfalls when a CSO event is not occurring.

Some stormwater flows overland to the Blackstone and Moshassuck Rivers, but there are no city-owned drainage conveyance structures. Since 2003, the City of Central Falls has been participating in the RIPDES MS4 Permit program due to the lack of definitive mapping information for the MS4 and CSS systems. The Rhode Island Department of Transportation (RIDOT) provided outfall mapping information to the City of Central Falls in 2006 and identified 7 outfalls associated with the CSS and MS4 systems, as shown on **Figure 2.2**.

In 1998 RIDEM approved a Three-Phase Program that will eliminate or provide treatment of NBC's combined sewer overflows. The overflows in Central Falls are to be addressed in Phase III of the program, which is currently being reevaluated to determine if changes should be made to the approved plan. After the reevaluation is completed at the end of 2014, NBC will begin design of the approved facilities. Additional information can also be found in the NBC's *Concept Design Report Amendment – 2nd Reaffirmation*, dated 2011. A drawing of CSO 101 is provided as **Figure 2.3** to illustrate the current infrastructure.

Figure 2.2 CSO/MS4 Outfalls in Central Falls

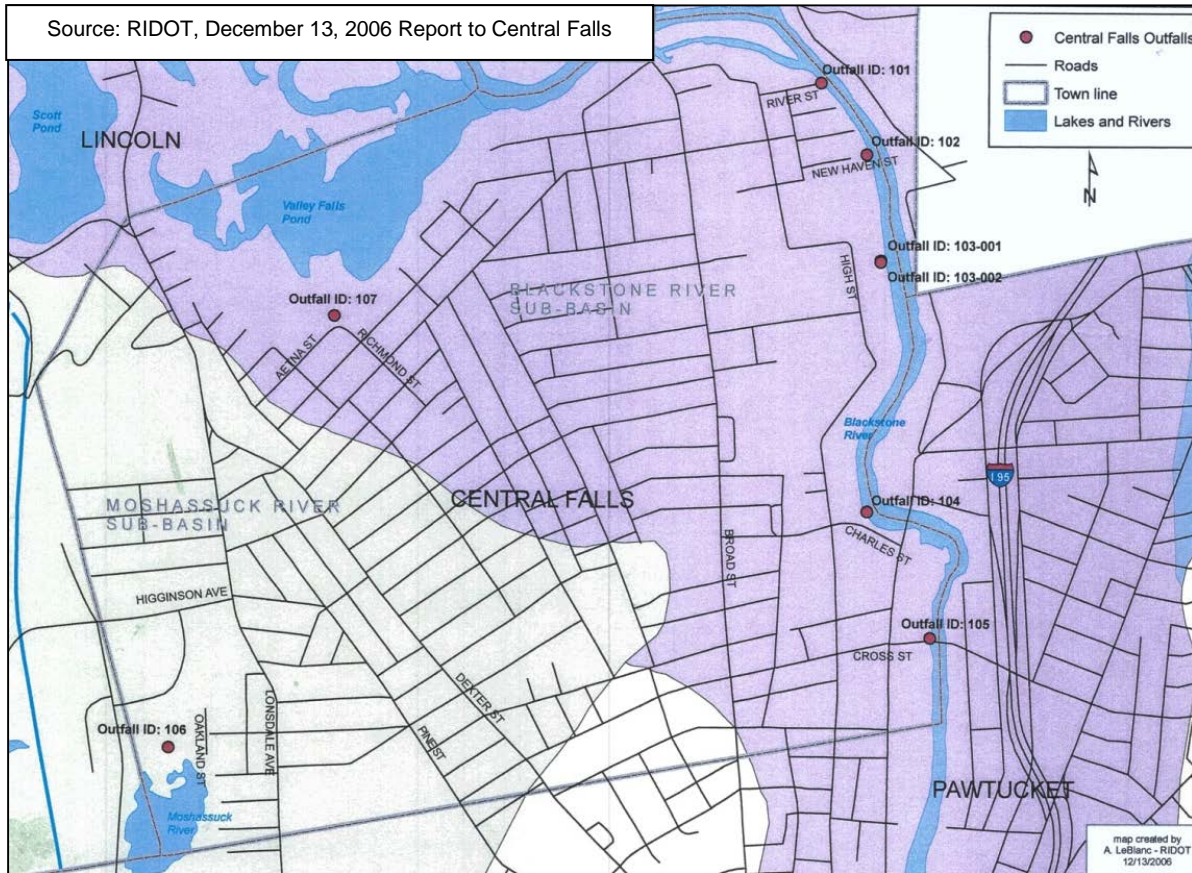
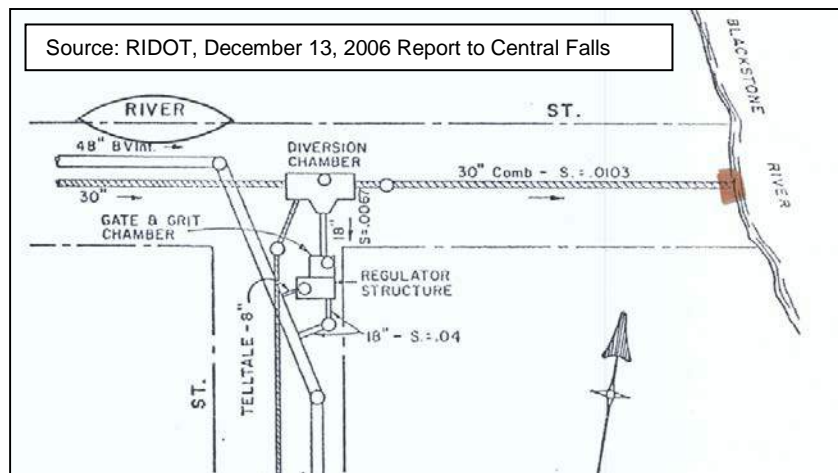


Figure 2.3 CSO Discharge 101 in Central Falls



In addition to the CSS, the City has approximately 27 miles of roads that they are responsible for operating and maintaining. No data are available for structural stormwater BMPs, except for pervious pavement at the Ledge Street parking lot (municipal property).

Funding Sources: The City has not set aside funding for capital improvements and current Department of Public Works (DPW) operations are funded under the general fund, which includes the stormwater program. Some fees are collected for road opening and sewer permits.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City in order of importance:

1. Aging infrastructure
2. Compliance requirements
3. Quality of life and aesthetics

City staff indicated that flooding is not a significant concern, but some localized street flooding occurs when inlet structures become clogged with debris. For example, this occurs frequently along Higginson Avenue at the High Street underpass, near the Wyatt Detention Facility.

The concerns for implementing a regional stormwater utility for Central Falls were identified in the following order of importance:

1. One area “bailing out” another one – “paying for another’s past sins” (tied for first)
2. Building a bureaucracy – “fee creep” (tied for first)
3. Consistency in treatment, fairness – “getting my share”
4. Responsiveness – “who controls priorities”
5. Being penalized for another’s non-compliance
6. Being dominated by one entity

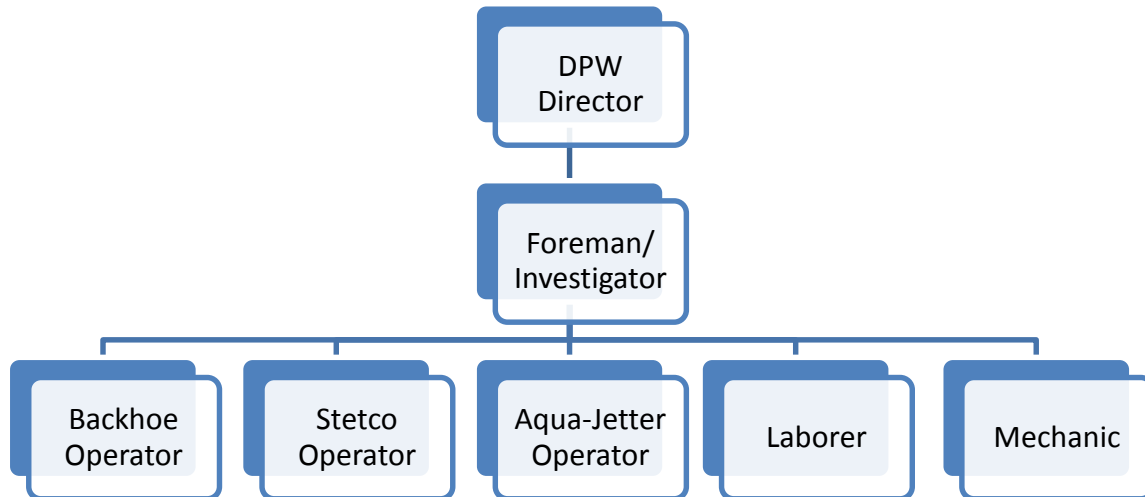
In general, City staff felt that a regional stormwater utility does not seem appropriate for the City of Central Falls since there is such a limited separate storm sewer system. However, City staff felt that regional planning and collaboration may benefit the City to address stormwater issues as they relate to the operation and maintenance of the CSS.

Public Awareness: City staff rated the level of community awareness as low and identified the following sensitive issues: rate affordability, no new fees or taxes and politics.

Available Data: The City of Central Falls does not maintain a geographic information system (GIS) and relies on the GIS available through the state. As a result, the updated Statewide Impervious Cover layer is the best available data for Central Falls. A GIS parcel layer was acquired from RIDEM, but this layer consisted strictly of physical data and did not contain attributes such as land use by parcel. The Tax Assessor’s database was not used during this study to evaluate data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.2.2 Program Management & Level of Service

Stormwater in the City of Central Falls is handled through the combined sewer system (CSS); therefore, the management (operation and maintenance) of the system falls under the Wastewater Collection System Maintenance Department. No significant activities (e.g., stormwater master planning, floodplain management) are conducted by other City departments. An organizational chart for the Wastewater Collection System Maintenance Department is provided below.



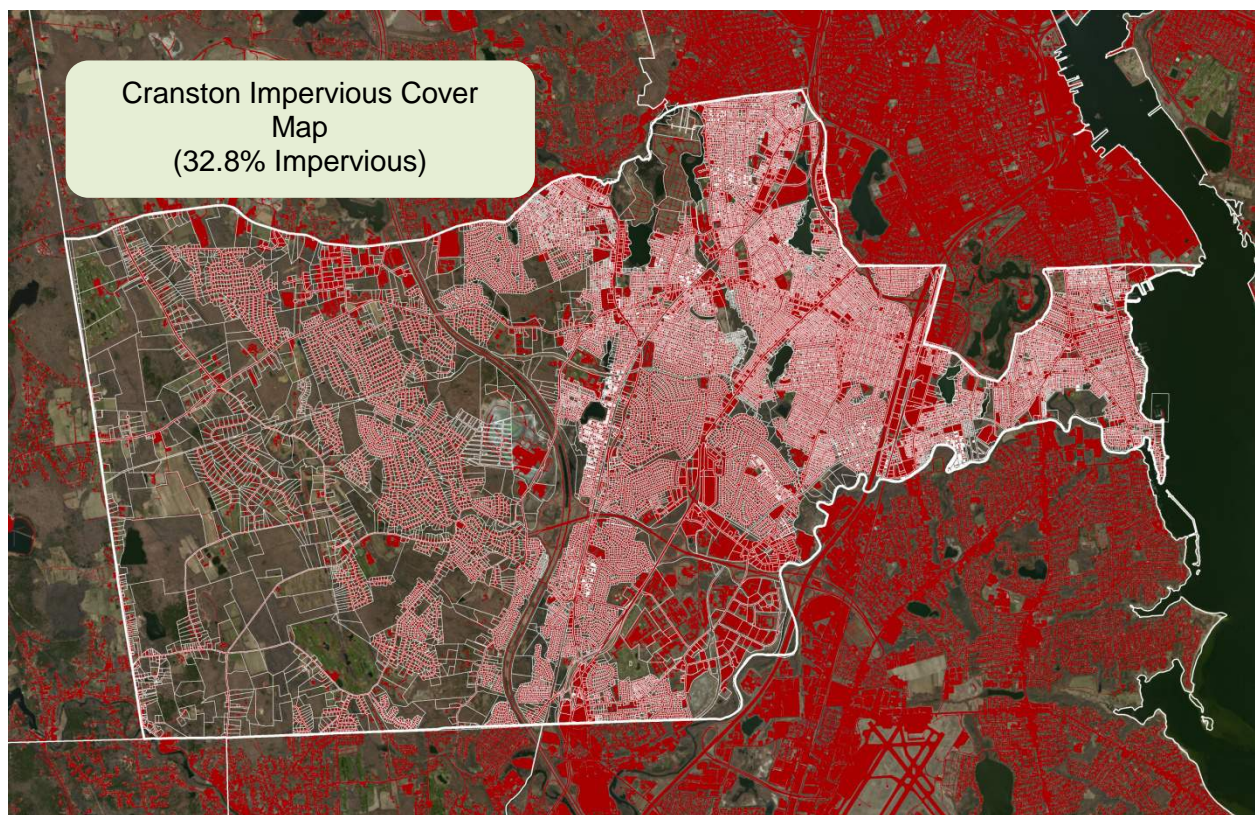
The stormwater program is nearly non-existent in Central Falls since 100% of the City is served by a combined sewer system. Therefore, activities such as street sweeping and catch basin cleaning are conducted within areas that drain to the CSS. Approximately 20-30% of the catch basins within the City are cleaned annually and about 5% of the trunk lines are jetted annually. The City recently purchased a truck for catch basin cleaning to increase the annual cleaning frequency and the City has increased street sweeping to 4 days a week from spring to fall. City staff indicate that grease is a significant issue in the CSS.

The stormwater program cost was estimated based on the percent of DPW labor related to stormwater program planning (e.g., MS4 annual reports) and coordination of stormwater related maintenance activities with other entities (i.e., NBC, neighboring communities). This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.5** below.

Table 2.5 Central Falls Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	\$7,524	Labor for DPW administration (<3%)
<i>Indirect Cost Allocation (20%)</i>	\$8,861	% total budget
Operations and Maintenance	\$36,783	Labor for DPW activities (<3%)
Engineering and Master Planning	\$0	CSS only, none for MS4
Regulation/Enforcement	\$0	CSS only, none for MS4
Capital Improvement Projects	\$0	CSS only, none for MS4
<i>Major Capital Projects</i>	\$0	
<i>Minor Capital Projects</i>	\$0	
Water Quality Monitoring	\$0	None conducted
Total	\$53,168	

2.3 Cranston



The City of Cranston is 28.9 square miles in area and is mostly composed of forest, roadways, and residential areas. **Table 2.6** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.6 Land Use in Cranston

Land Use Type	Percent Coverage in Cranston
Deciduous Forest	26.0%
Water	12.7%
Roads	11.2%
High Density Residential	10.0%
Medium High Density Residential	9.0%
Medium Density Residential	6.3%
Commercial	5.7%
Mixed Forest	2.6%
Mines, Quarries, Gravel Pits	2.6%
Industrial	2.3%
Institutional	2.1%
Cropland	2.0%
Developed Recreation	1.6%
Other	5.9%

Leadership/Governance: Cranston operates under a Mayor-City Council form of government. The current mayor is Allan Fung and the City Council is composed of members representing six wards and three councilors at large.

Population: According to the Rhode Island Department of Labor and Training the 2000 census reported a population of 79,269 and the 2010 census reported a population of 80,387. This represents a 1.4% increase in population over the ten year span.

Economic Condition: Staff reports that the City currently operates with no deficits, but that budgetary flexibility is minimal.

Key Industry: Key industries in Cranston include retail, light manufacturing, and dining. Large businesses in the City include Pepsi Bottling Group, Falvey Linen & Uniform Supply and Walmart.

2.3.1 Stormwater System & Local Issues

Cranston has a completely separate MS4 system. City staff report that the MS4 system was originally constructed as a separate system and was never combined with the sanitary sewer system. The City maintains approximately 318 miles of City roads, 139 miles of drainage piping, 7,222 catch basins and manholes and 549 MS4 outfalls. The City inspects and maintains six Best Management Practices (BMPs) that were installed as part of the Stillhouse Cove revetment and drainage improvements to Narragansett Bay.

Funding Sources: The City currently has \$300,000 available from a 2008 \$6M bond for capital improvement projects for stormwater infrastructure. The \$6M bond was approved by voters, but the remaining bonds have not been sold yet. The remaining stormwater program is funded through the general fund.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City, in no particular order:

- Flooding problems
- Aging infrastructure
- Development pressures
- Ecological concerns
- Preservation of property value

City staff indicated that the floods of 2010 had a major impact from which the City is still recovering. In March 2010, after five inches of rain, the Pawtuxet River overflowed and impacted many sites such as the Warwick Mall, Contour Dental Laboratories, and the CLCF Building.



Source: City of Cranston DPW

The following concerns for implementing a regional stormwater utility in Cranston were identified, in no particular order:

- One area “bailing out” another one – “paying for another’s past sins”
- Losing local control of zoning, land use, etc. – “big brother decides for me”
- Building a bureaucracy – “fee creep”
- Consistency in treatment, fairness – “getting my share”
- Being dominated by one entity

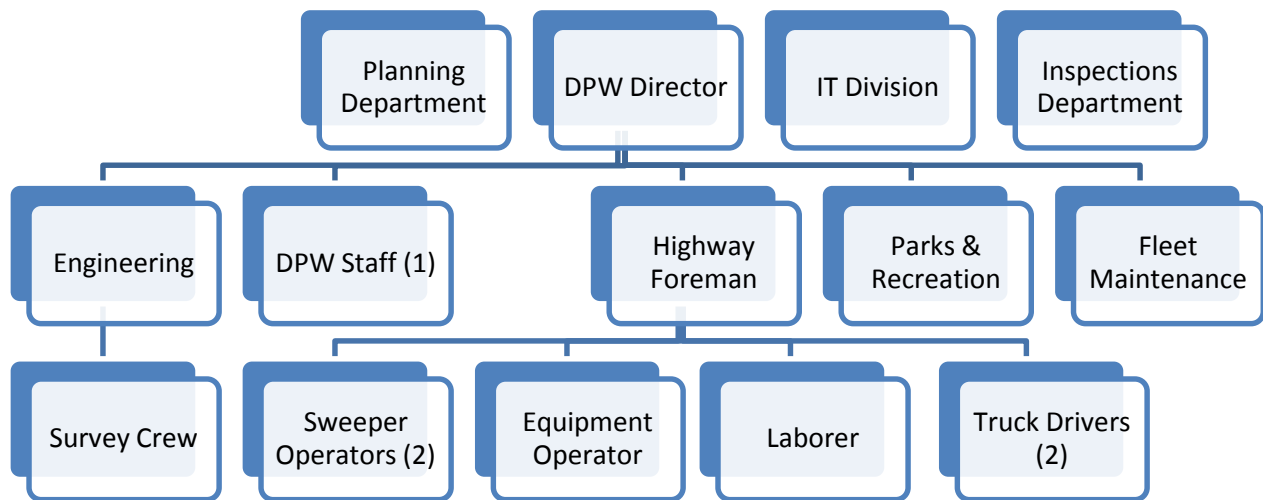
Public Awareness: Outreach and education efforts in the City include distribution of brochures regarding stormwater related issues in the City, updates on the City webpage and coordination with nonprofit organizations. City staff reported the overall stormwater awareness in the general population to be fairly low with only a fraction of the population aware of stormwater related issues. This latter group is comprised primarily of individuals in environmental groups and those subject to recent flooding events. The following sensitive issues were identified: rate affordability, no new taxes or fees and flooding issues.

Available Data: The City of Cranston has mapped their storm sewer system in GIS including outfalls, catch basins and manholes. In 2012, a cursory update to the 2003 Statewide Impervious Cover layer was conducted for Cranston as part of RIDEM Office of Water Resources’ initial stormwater utility feasibility study. In order to maintain a consistent methodology for the capture of impervious area in the UNB region, the recently updated

Statewide Impervious Cover layer was used for the Phase I Study. A GIS parcel layer, containing land use data by parcel, was acquired from RIDEM as part of the study. The Tax Assessor's database was not used during this study to evaluate data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.3.2 Program Management & Level of Service

Management of the stormwater program in the City of Cranston primarily falls under the Department of Public Works, which includes the Department of Highway Maintenance, Department of Engineering and the Division of Fleet Maintenance. Other City departments play a role in stormwater management, including: Department of Planning for floodplain management and stormwater master planning; Department of Inspections for enforcement; and Division of Information Technology for GIS and stormwater program data management. An organizational chart for management of the stormwater program is provided below.



The MS4 system in Cranston is extensive and requires a significant effort for operation and maintenance. Approximately 1,500 (20%) catch basins within the City are cleaned annually and over 1,000 road miles are swept annually. The City has a more frequent inspection and maintenance schedule for catch basins in areas that drain to impaired waters with a completed TMDL Study, which include: Spectacle Pond and the Roger Williams Park Ponds and other



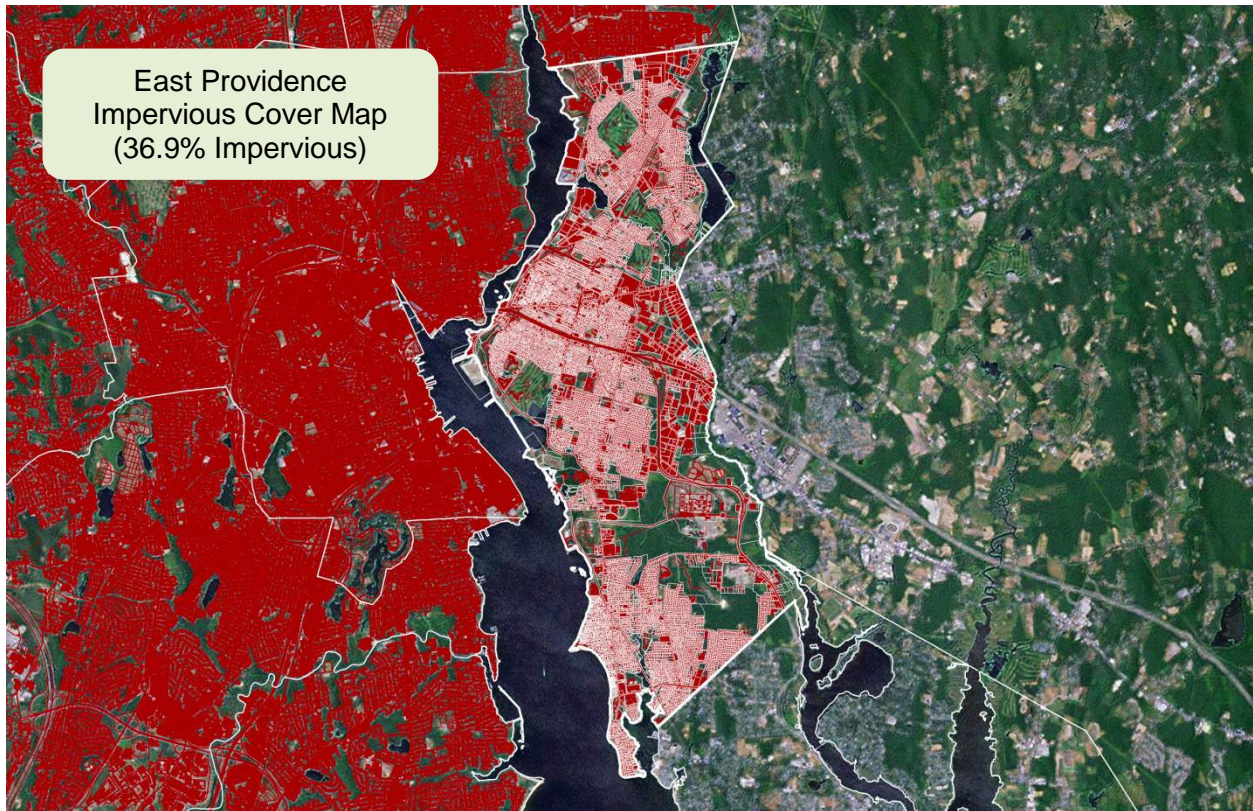
areas of concern (e.g., Stillhouse Cove). The City evaluated the TMDL study for Spectacle Pond and subsequently developed the Lake Street Outfall Maintenance Project to address stormwater management and nutrient issues that are impacting Spectacle Pond. The project is scheduled to be constructed as funding is made available.

The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.7** below.

Table 2.7 Cranston Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	\$23,504	Labor for DPW administration
<i>Indirect Cost Allocation (20%)</i>	\$225,679	% total budget
Operations and Maintenance	\$536,551	Labor across multiple depts., materials & expenses
Engineering and Master Planning	\$8,481	Labor across multiple departments
Regulation/Enforcement	\$9,858	Labor across multiple departments
Capital Improvement Projects	\$550,000	Total
<i>Major Capital Projects</i>	\$300,000	City-wide drainage improvements
<i>Minor Capital Projects</i>	\$250,000	Water quality projects (Lake St. Outfall)
Water Quality Monitoring	\$0	None conducted
Total	\$1,354,073	

2.4 East Providence



The City of East Providence is approximately 14 square miles. Land use is generally more residential than in many of the other municipalities in the study area, but also includes significant forested area and commercial areas. **Table 2.8** below summarizes the land use in the City of East Providence from 2011 data available through the State of Rhode Island GIS database.

Table 2.8 Land Use in East Providence

Land Use Type	Percent Coverage in East Providence
Medium High Density Residential	24.0%
Deciduous Forest	20.7%
High Density Residential	11.6%
Commercial	9.9%
Developed Recreation	6.0%
Industrial	4.3%
Water	3.5%
Institutional	2.8%

Land Use Type	Percent Coverage in East Providence
Wetland	2.6%
Roads	2.4%
Medium Density Residential	1.8%
Vacant Land	1.6%
Brushland	1.4%
Cemeteries	1.4%
Other Transportation	1.3%
Transitional Areas	1.2%
Other	3.5%

Leadership/Governance: East Providence has a City Council with a City Manager (currently Paul Lemont). The City Council consists of five elected officials, one from each of the four wards within the City and one elected at-large. The Mayor and Assistant Mayor are elected by the Council from among its members. The Mayor presides at Council meetings and is the ceremonial head of City Government. The Assistant Mayor acts as Mayor during the absence or disability of the Mayor.

Population: According to the Rhode Island Department of Labor and Training the 2000 Census reported a population of 48,688 and the 2010 Census reported a population of 47,037 in the City of East Providence, marking a -3.4% percent change in population over the ten year span.

Economic Condition: The City of East Providence is considered to be financially stable. The City initiated a budget commission to assure the implementation of appropriate measures to secure the financial stability of the City. The Commission was established by the Director of Revenue on December 11, 2011 and was dissolved by the Director of Revenue on September 16, 2013, pursuant to the determination of fiscal stability.

Key Industry: Key Industries in East Providence include manufacturing (Aspen Aerogels), energy management (Eaton Corporation), automotive sales, banking, technology, insurance provision, recreation and medical services.

2.4.1 Stormwater System & Local Issues

East Providence has a fully separate storm sewer system. Staff report that the system was built as a separate system. The existing storm drain system was constructed between the 1800s and 1980s. There are 66 miles of drains all connected to a MS4. Additionally there are two miles of drainage swales. The City has 2,109 catch basins, 955 curb inlets, 1,354 drainage manholes, 50 drywells and 133 outfalls. The City also maintains 28 BMPs annually and sweeps 150 City-owned miles of road twice a year. BMPs maintained by the City include: detention basins, grass swales and proprietary systems (e.g., Stormceptors).

Funding Sources: Funding for the City's stormwater services is budgeted through the general fund. Additional funding for water quality improvement projects has historically been provided through grants.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in order of priority:

1. Flooding problems
2. Quality of life and aesthetics
3. Aging infrastructure
4. Water quality protection

The following concerns for implementing a regional stormwater utility in East Providence were identified, in no particular order:

- One area "bailing out" another one – "paying for another's past sins"
- Losing local control of zoning, land use, etc. – "big brother decides for me"
- Building a bureaucracy – "fee creep"
- Consistency in treatment, fairness – "getting my share"
- Being dominated by one entity

Public Awareness: The City of East Providence has developed a number of community outreach programs. Recently the City distributed recycling pamphlets, completed a shoreline clean-up project and included educational brochures in water bills. City staff reported the overall stormwater awareness in the general population to be low and noted the following sensitive issues in the community, in no particular order:

- Rate affordability
- No new fees or taxes
- Political issues
- Flood reduction

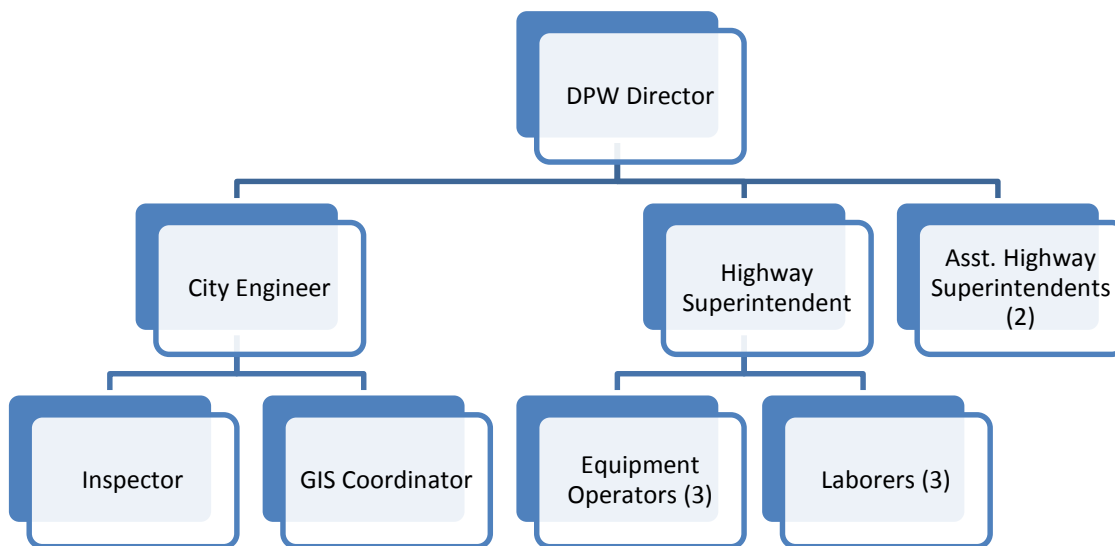
Regarding rate affordability, the City is well aware of the recent sanitary sewer rate increases due to the upgrades at the Wastewater Treatment Plant for nitrogen removal and pump station rehabilitation that were completed in May 2013 at a cost of \$52M. Also, water rates will likely increase due to system improvements that are needed. A \$19M bond for the improvements is currently before the City for approval.

Available Data: The City of East Providence has a GIS database that includes parcel boundaries, the storm drain network and sanitary sewer network. However, this database does not include an impervious cover layer. As a result, the updated Statewide Impervious Cover layer was used for East Providence. A GIS parcel layer was acquired from RIDEM, but this layer contained geospatial data and did not contain attributes such as land use by parcel. The Tax Assessor's database was not used during this study to evaluate data for land use by parcel.

This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.4.2 Program Management & Level of Service

Management of the stormwater program in the City of East Providence primarily falls under the Department of Public Works. The DPW coordinates with staff in the Planning Department, but these staff do not have a significant role in stormwater management. An organizational chart for management of the stormwater program is provided below.



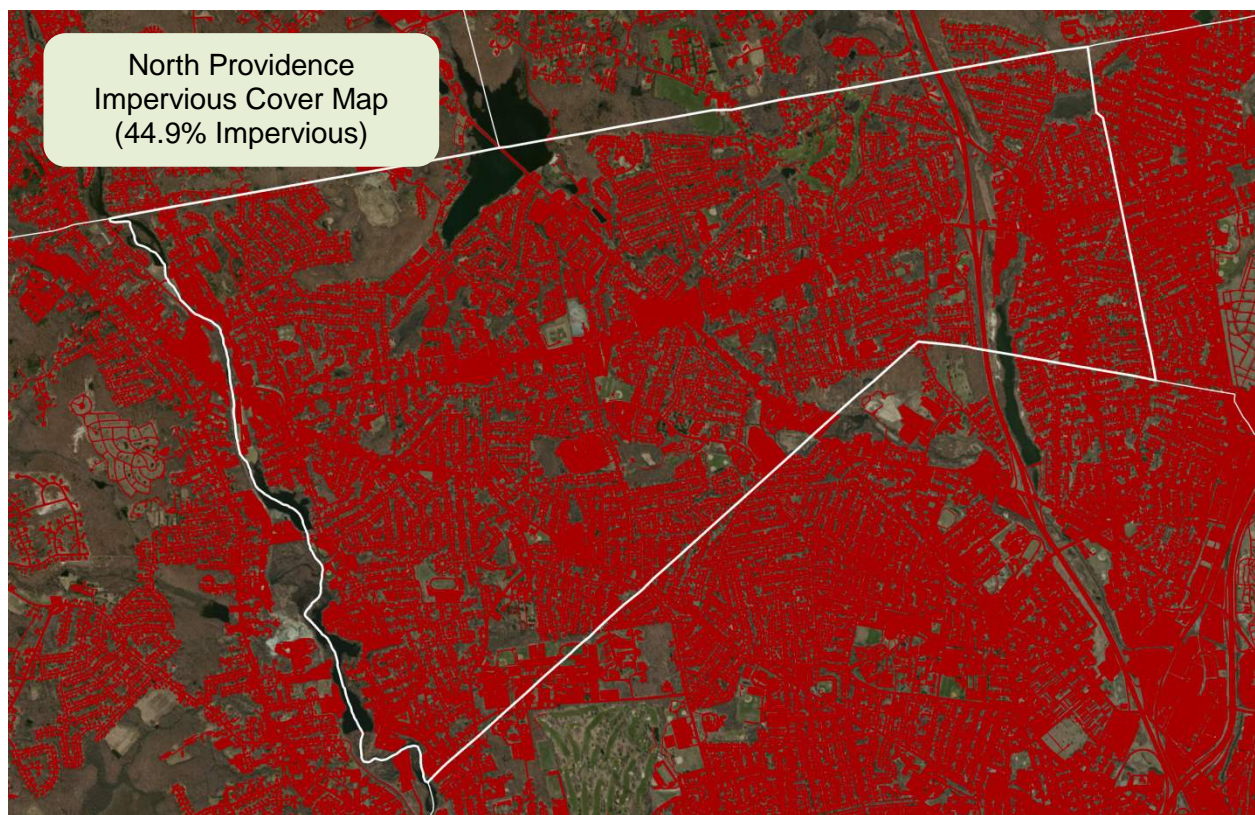
The MS4 system in East Providence requires a significant effort for operation and maintenance, including the inspection and maintenance of BMPs by the Public Works Department. Approximately 525 (25%) catch basins within the City are cleaned annually and pipes are cleaned as needed using a jet/vac truck.

The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.9** below.

Table 2.9 East Providence Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	\$15,000	Labor for DPW administration
<i>Indirect Cost Allocation (20%)</i>	\$45,900	% total budget
Operations and Maintenance	\$157,000	Labor across multiple depts., materials & expenses
Engineering and Master Planning	\$37,000	Labor across multiple departments
Regulation/Enforcement	\$0	No significant costs
Capital Improvement Projects	\$0	None at this time
<i>Major Capital Projects</i>	\$0	N/A
<i>Minor Capital Projects</i>	\$0	N/A
Water Quality Monitoring	\$20,500	RIPDES Permit, water quality monitoring, IDDE
Total	\$275,400	

2.5 North Providence



The Town of North Providence is approximately 5.8 square miles and is made up of primarily residential land use with some forest, commercial and industrial areas. **Table 2.10** below summarizes the land use in North Providence from 2011 data available through the State of Rhode Island GIS database.

Table 2.10 Land Use in North Providence

Land Use Type	Percent Coverage in North Providence
Roads	26.8%
High Density Residential	23.3%
Deciduous Forest	22.2%
Medium High Density Residential	18.4%
Commercial	2.4%
Institutional	1.5%
Water	1.3%
Medium Density Residential	1.0%
Other	3.1%

Leadership/ Governance: North Providence is governed by a Mayor and Town Council form of government. The current Mayor is Charles Lombardi, who serves as the executive chief and administrative officer, as well as the Town’s Public Safety Director. The Town Council consists of seven members: two elected from each of three Town districts and a counselor-at-large.

Population: As reported by the Rhode Island Department of Labor and Training the 2000 Census reported a population of 32,411 and the 2010 Census reported a population of 32,078 in the Town of North Providence, marking a -1.0% percent change in population over the ten year span.

Economic Condition: Educational, health care and social assistance industries experienced the most growth in recent years while the manufacturing industry experienced a downturn.

Key Industry: Based on 2009 employment rates from the North Providence Comprehensive Plan, key industries in the Town include manufacturing; retail trade; finance and insurance; educational, social and health care services; and arts, entertainment and recreation.

2.5.1 Stormwater System & Local Issues

The existing storm drain system is approximately 100 years old and several areas of flooding in North Providence have been noted during wet weather by Town representatives. North Providence is partially built on the Woonasquatucket River and West River, which occasionally experience flooding and overtopping. Each river has a number of tributaries throughout North Providence which also experience flooding during wet weather, causing issues for many neighborhoods throughout the Town. The Town has approximately 115 miles of public streets, 780 municipally owned catch basins and 49 outfalls.

Funding Sources: The DPW has an annual budget of approximately \$70,000 for all stormwater related activities that is paid through the general fund. An additional \$15,000 budget for a part time Stormwater Coordinator has historically been paid for through grants. Since the beginning

of the MS4 General Permit the Town has spent approximately \$12,500 per year on permit compliance activities that include: annual reporting, equipment, ordinances, BMP surveys and planning documents. This money has been paid with reimbursable grant funding. **Tables 2.11 and 2.12** below show recent fiscal year budgets and MS4 costs incurred from 2003 - 2012, respectively.

Table 2.11 North Providence Department of Public Works Stormwater-Related Budget

Budget Item	Existing FY 2011 - 2012	Proposed FY 2012 - 2013
Street Sweeping	\$20,000	\$20,000
Water Jet Operator	\$34,174	\$35,193
Sand, Gravel and Pea Stone	\$1,000	\$1,000
Weed and Pest Control	\$750	\$750
Sewer Maintenance	\$10,000	\$10,000
Pipes and Collars	\$1,500	\$1,500
Supplies	\$2,500	\$2,500
Total	\$69,924	\$70,943

Table 2.12 North Providence Costs for MS4 Permit Compliance (2003-2012)

Item	Approximate Cost
Annual Reporting (x8)	\$24,000
Outfall Surveys and Equipment	\$30,500
Ordinances (x3)	\$9,000
BMP Surveys	\$2,000
Planning Documents	\$34,150
Total (8 years)	\$99,650
Approximate Annualized Cost	\$12,456

Available Data: The Town of North Providence does not currently maintain its own GIS. The Town's outfalls were mapped in GIS by its on-call stormwater consultant in 2012. The Town has digitally mapped its parcels; however, remapping is underway to enhance the accuracy of this data. As a result, the updated Statewide Impervious Cover layer was used for North Providence and no parcel layer was provided during this study. The Tax Assessor's database was not used during this study to evaluate data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.5.2 Program Management & Level of Service

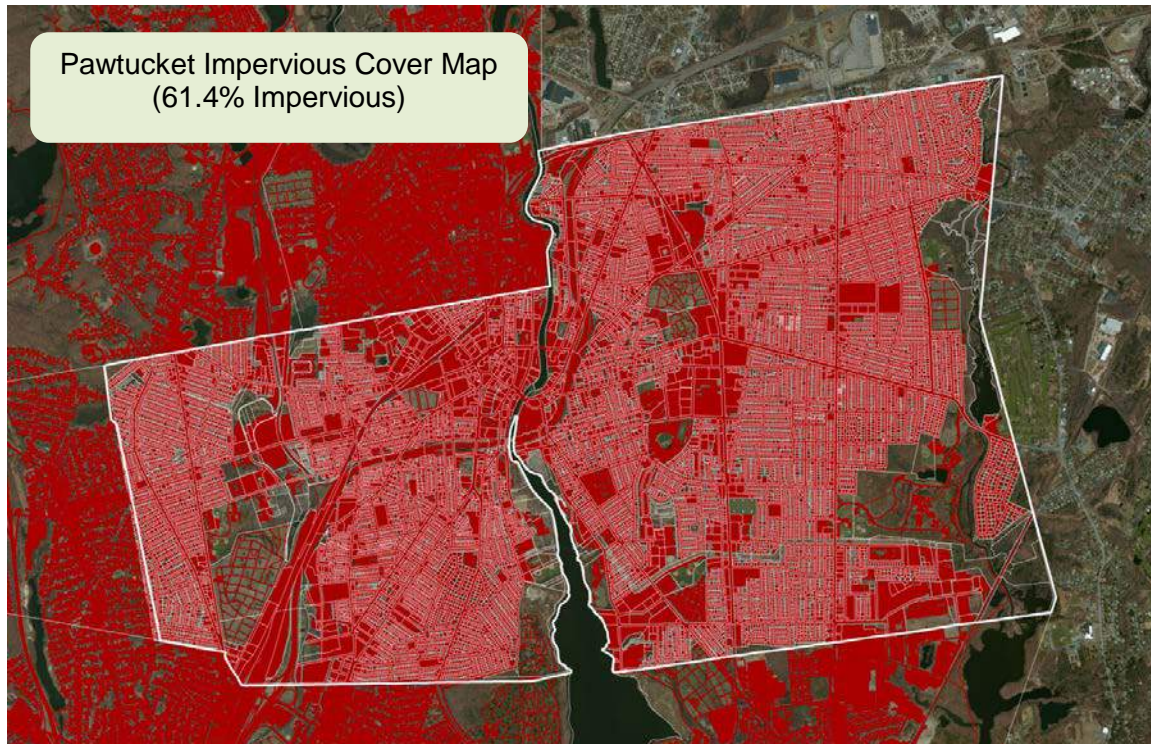
Management of the stormwater program in the Town of North Providence primarily falls under the Department of Public Works. The DPW coordinates with staff in the Planning Department, but these staff do not have a significant role in stormwater management. Detailed information regarding the program management and level of service was not provided for this study.

The Project Team estimated the current stormwater program cost based on past stormwater-related work in North Providence by Fuss & O'Neill. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.13** below.

Table 2.13 North Providence Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	\$15,000	Labor for DPW administration
<i>Indirect Cost Allocation (20%)</i>	\$19,641	% total budget
Operations and Maintenance	\$70,750	Labor across multiple depts., materials & expenses
Engineering and Master Planning	\$0	No significant costs
Regulation/Enforcement	\$0	No significant costs
Capital Improvement Projects	\$0	None conducted
<i>Major Capital Projects</i>	\$0	N/A
<i>Minor Capital Projects</i>	\$0	N/A
Water Quality Monitoring	\$12,456	RIPDES Permit compliance activities
Total	\$117,847	

2.6 Pawtucket



The City of Pawtucket is approximately 8.7 square miles and is heavily residential with some commercial and industrial land. **Table 2.14** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.14 Land Use in Pawtucket

Land Use Type	Percent Coverage in Pawtucket
High Density Residential	31.4%
Roads	26.8%
Deciduous Forest	16.7%
Commercial	6.2%
Industrial	4.0%
Water	3.3%
Cemeteries	2.6%
Medium High Density Residential	2.2%
Institutional	1.6%
Developed Recreation	1.4%
Railroads	1.2%
Other	2.6%

Leadership/Governance: The City has a Mayor and City Council form of government. Pawtucket's current Mayor is Donald R. Grebien, who is responsible for chief executive and administrative duties, as well as overseeing all other City departments. The City Council is composed of nine members: three councilors-at-large and six district councilors from each of six districts. The current City Council term runs from 2013 to 2015.

Population: According to the Rhode Island Department of Labor and Training 2000 census, the City had a population of 72,958 and the 2010 census reported a population of 71,148 indicating a -2.5% percent change in population over the ten year span.

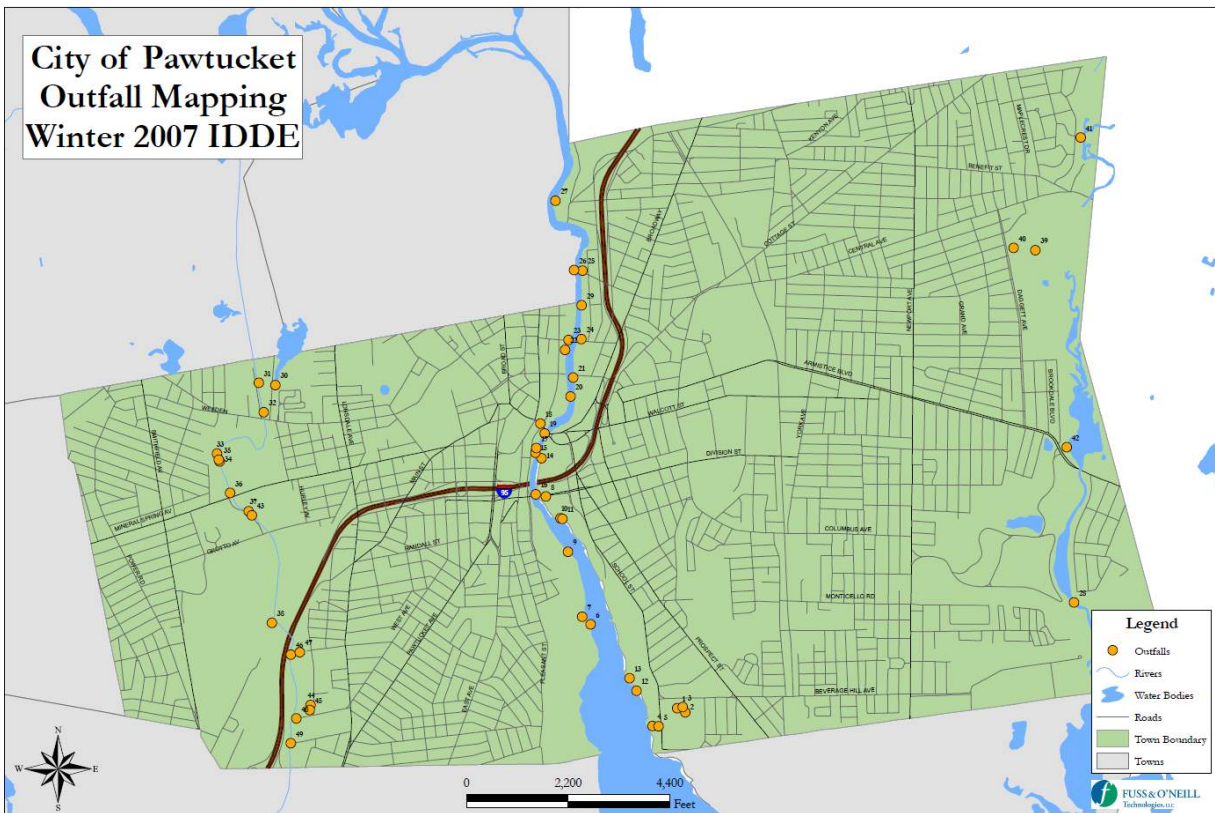
Economic Condition: Although the City has struggled economically in recent years, discussions with City staff and review of the 2011 Community Comprehensive Plan indicate conditions are improving.

Key Industry: The largest employers in Pawtucket include Hasbro, Pawtucket Red Sox and Apex, tenants of the shopping plaza on Newport Avenue and the tenants of the Narragansett Industrial Park.

2.6.1 Stormwater System & Local Issues

The City of Pawtucket currently maintains approximately 182 miles of road, 200 miles of combined sewer and separate storm drain pipes, 6,000 catch basins and manholes (city-wide), and 49 MS4 outfalls. The City inspects and maintains one stormwater BMP (detention basin). According to information in the 1994 report by Louis Berger & Associates, Inc. (see Appendix VI), approximately 83.2% of Pawtucket drains to a combined sewer system and the remaining 16.8% drains to the separate MS4. Stormwater outfalls are shown on **Figure 2.4** and indicate that there are additional separate MS4 areas within the CSS areas shown on the map in Appendix VI.

Figure 2.4 Stormwater Outfalls in Pawtucket



The City of Pawtucket is nearly 100% sewered and the sanitary sewer and combined sewer systems discharge to NBC interceptor sewers that convey flow to the Bucklin Point wastewater treatment plant in East Providence. A total of 19 CSO structures are located within Pawtucket along the Blackstone and Seekonk Rivers to provide relief of excess flows in the combined system.

Funding Sources: The City funds the stormwater program through the general fund.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in order of importance:

1. Aging infrastructure
2. Preservation of property value
3. Compliance requirements

Obstacles identified against implementation of a stormwater utility district in Pawtucket include the following in order of priority:

1. Losing local control of zoning, land use, etc. - “big brother decides for me”
2. Responsiveness - “who controls priorities”

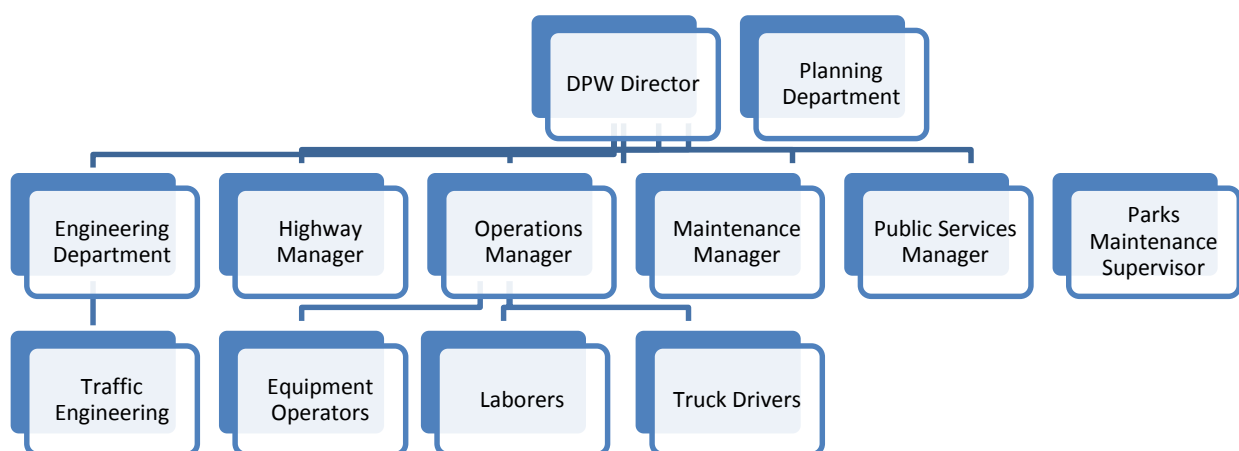
3. Consistency in treatment, fairness - “getting my share”
4. Being dominated by one entity
5. One area “bailing out” another one - “paying for another’s past sins”

Public Awareness: The City relies upon the Stormwater Education and Outreach Program in cooperation with the University of Rhode Island (URI) to assist in meeting the RIPDES MS4 Permit requirements. City staff have indicated that the community level of awareness regarding stormwater-related issues is low and the key sensitive issue is not wanting a new fee or tax. City staff also felt that the community perception is such that a new fee would scare businesses and that most people think they are already taxed for such programs.

Available Data: The City of Pawtucket has zoning boundaries as well as parcel boundary data available in GIS. City outfalls have also been mapped in GIS, but Pawtucket does not have an impervious cover layer. As a result, the updated Statewide Impervious Cover layer was used for Pawtucket. A GIS parcel layer was acquired from RIDEM, but this layer consisted strictly of physical data and did not contain attributes such as land use by parcel. An extract from the Tax Assessor’s database was provided for Phase I of the study, but the extract only contains basic residential versus non-residential data. The database does not differentiate between single family residential and other residential, which will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.6.2 Program Management & Level of Service

Management of the stormwater program in the City of Pawtucket primarily falls under the Department of Public Works and Engineering Department. The DPW and Engineering Department coordinate with staff in the Planning Department, but these staff do not have a significant role in stormwater management. An organizational chart for management of the stormwater program is provided below.



The MS4 system is estimated to be encompass approximately 10% of the City, but the extent and drainage areas for the MS4 and CSS have not been accurately mapped. Additional

mapping of the MS4 system was completed as part of the Ten Mile River TMDL Study and this information should be incorporated into the City's mapping efforts. Approximately 250 (4%) catch basins within the City (MS4 & CSS areas) are cleaned annually and all City streets are swept at least once annually.

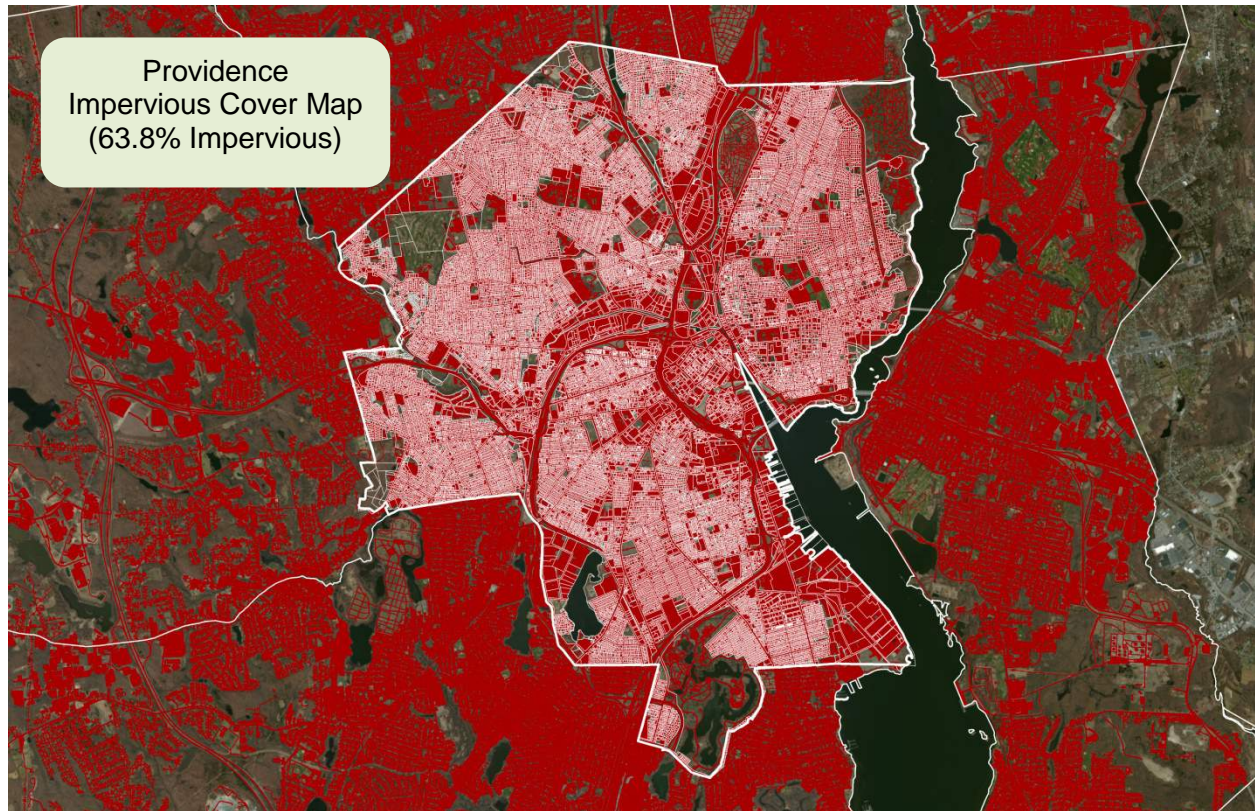
The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater (i.e., 10% MS4 allocation). This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.15** below.

Table 2.15 Pawtucket Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	\$795	Labor for DPW administration
<i>Indirect Cost Allocation (20%)</i>	\$22,624	% total budget
Operations and Maintenance	\$62,532	Labor for DPW, materials & expenses (8-17% MS4)
Engineering and Master Planning	\$16,893	Outside services
Regulation/Enforcement	\$7,399	Development plan review
Capital Improvement Projects	\$25,500	Total
<i>Major Capital Projects</i>	\$0	N/A
<i>Minor Capital Projects</i>	\$25,500	Minor repairs for MS4 only
Water Quality Monitoring	\$0	None conducted
Total	\$135,743	

It is worth noting that the City of Pawtucket has a cost-sharing program for tree planting and recently began providing trees at no cost. The City pays a contractor to plant the trees in right-of-way locations on a first-come, first-serve basis for interested abutting property owners. There will be 100 planned plantings in 2014. While this program was not intended to be part of the stormwater program, urban tree plantings can provide stormwater benefits, ecological benefits and improve property value.

2.7 Providence



The City of Providence is approximately 18.8 square miles and is mostly composed of high density residential, roads and commercial/industrial areas. **Table 2.16** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.16 Land Use in Providence

Land Use Type	Percent Coverage in Providence
High Density Residential	37.9%
Roads	18.8%
Medium High Density Residential	9.7%
Commercial	6.5%
Institutional	6.1%
Deciduous Forest	4.2%
Industrial	4.2%
Developed Recreation	3.7%
Other Transportation	1.9%
Cemeteries	1.6%

Land Use Type	Percent Coverage in Providence
Commercial/Industrial Mixed	1.5%
Water	1.3%
Railroads	0.9%
Vacant Land	0.6%
Transitional Areas (urban open)	0.4%
Water and Sewage Treatment	0.2%
Mixed Forest	0.1%
Brushland	0.1%
Waste Disposal	0.1%
Medium Density Residential	0.1%
Commercial/Residential Mixed	0.1%
Wetland	0.1%

Leadership/Governance: Providence has a Mayor and City Council form of government. The current mayor is Angel Taveras and the City Council consists of fifteen (15) City Councilors, one for each of the City’s wards.

Population: According to the Rhode Island Department of Labor and Training the 2000 census reported a population of 173,618 and the 2010 census reported a population of 178,042 in the City of Providence. This represents a 2.5% increase in population over the ten year span.

Economic Condition: The following information was obtained from the City of Providence Comprehensive Annual Financial Report (fiscal year ending June 30, 2013): “Upon taking office in January 2011, Mayor Angel Taveras signed an Executive Order creating an independent Municipal Finances Review Panel to conduct a full review of the City’s finances. On March 3, 2011, the Panel delivered a report that identified a \$110 million structural deficit in FY2012. Through collaborative efforts and shared sacrifice, the Taveras administration, with the partnership of the Providence City Council and stakeholders across the City, has all but eliminated the City’s \$110 million structural deficit and ended fiscal year 2013 with a \$1.57 million surplus in the general fund.”

Key Industry: Key industries in Providence include education, healthcare, finance and trade. Large businesses in the City include Rhode Island Hospital, Brown University, Bank of America, Women and Infants Hospital, Miriam Hospital, Roger Williams Medical Center, Citizens Bank, Verizon, Johnson & Wales University and Pinkerton Government Services. The Port of Providence is the second largest deepwater seaport in New England and handles cargo such as cement, chemicals, heavy machinery, petroleum and scrap metal.

2.7.1 Stormwater System & Local Issues

City staff estimate that approximately 60-70% of the land area in the City of Providence drains to the combined sewer system. According to information in the 1994 report by Louis Berger & Associates, Inc. (see Appendix VI), approximately 68.3% of Providence drains to a combined sewer system and the remaining 31.7% drains to the separate MS4. City staff estimate that the MS4 system is approximately 75% mapped and the City has started an asset evaluation program that will include additional detailed mapping.

The City is responsible for maintaining approximately 12,000 catch basins and 4,000 gutter inlets along 370 miles of City roads. The exact number of catch basins and inlets draining to each of the CSS and MS4 systems is unknown at this time. The City mapped all of its MS4 outfalls in 2008 and identified 175 discharges.

Funding Sources: The stormwater program is funded through the general fund. In November 2012 the City approved a \$40M Road Bond to improve over 65 miles of streets from 2013 to 2015. While the Road Paving Plan focuses primarily on reconditioning the roads, the construction activities will result in minor repairs and inspection/cleaning of the storm drain infrastructure.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City, in no particular order:

- Aging infrastructure
- Flooding problems (local streets)
- MS4 Permit compliance
- Water quality concerns

City staff indicated that there is a significant gap in funding for routine maintenance of the CSS and MS4 systems, as well as capital improvements to address water quality. City staff were interested in regionalizing the operation and maintenance of the CSS and MS4 systems to be performed by a separate entity.

City staff did not express any significant concerns regarding the implementation of a regional stormwater utility and noted that a regional approach seemed to be the most appropriate solution for the UNB region.

Public Awareness: Outreach and education efforts in the City primarily include working with Save The Bay for a marine science-based education program with the Providence Public Schools. City staff reported the overall stormwater awareness in the general population to be fairly low; however, a fraction of the population is acutely aware of stormwater related issues. This group is mostly composed of individuals in local environmental organizations. City staff noted that the general public would likely be sensitive to the following issues:

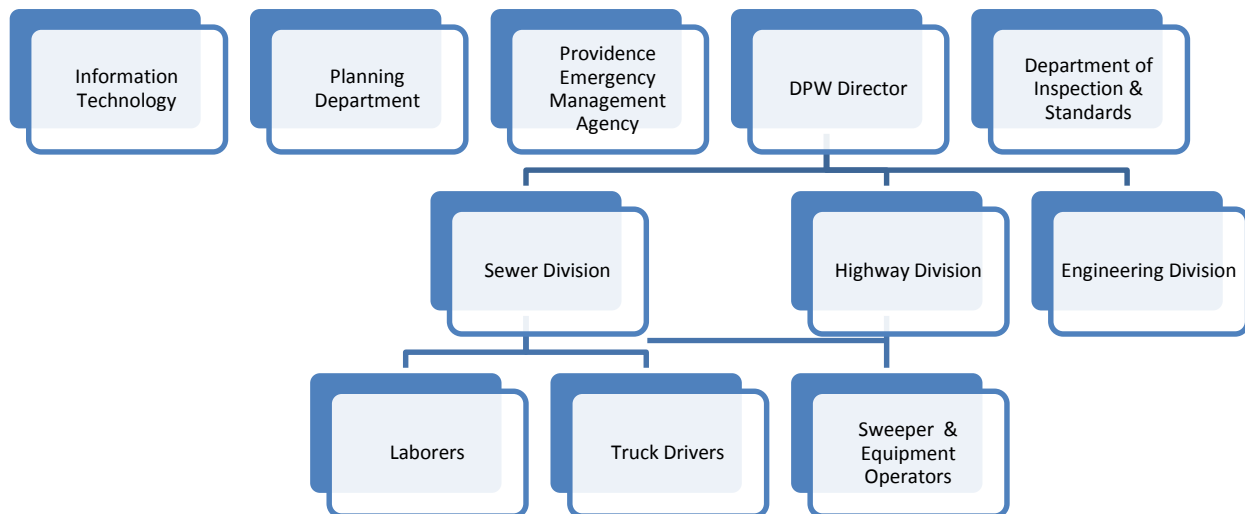
- Building a bureaucracy – fear of creating an effective entity to manage stormwater.

- Rate affordability – ability to bear the cost of aging infrastructure and stormwater issues.
- No new fees or taxes – rate payers may not support the need for a better program and only see a new fee or tax burden.

Available Data: The City of Providence has a comprehensive GIS database that includes parcel boundaries, the storm drain network and sanitary sewer network, impervious cover, etc. GIS data, including a parcel layer containing land use attributes and an impervious cover layer was acquired from the City. The Tax Assessor’s database was not used during this study to provide data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.7.2 Program Management & Level of Service

Management of the stormwater program in the City of Providence primarily falls under the Department of Public Works, which includes the Highway Division, Engineering Division and Traffic Engineering. Other City departments play a role in stormwater management, including: Department of Planning for floodplain management, master planning and GIS related analysis; Providence Emergency Management Agency for flooding and emergency response; Department of Inspections and Standards for enforcement; and Information Technology Department for GIS support. It is worth noting that the Providence Water Supply Board provides an advisory role and coordinates with other departments in the City to assist with various planning efforts and collaborative efforts to promote water conservation. An organizational chart for management of the stormwater program in Providence is provided below.



The MS4 and CSS systems in Providence are extensive and require a significant effort for operation and maintenance, but the City lacks the resources to adequately inspect and maintain MS4 and CSS structures. Approximately 760 (5%) catch basins within the City (MS4 & CSS areas) are cleaned annually to address key areas of concern based on public complaints and to

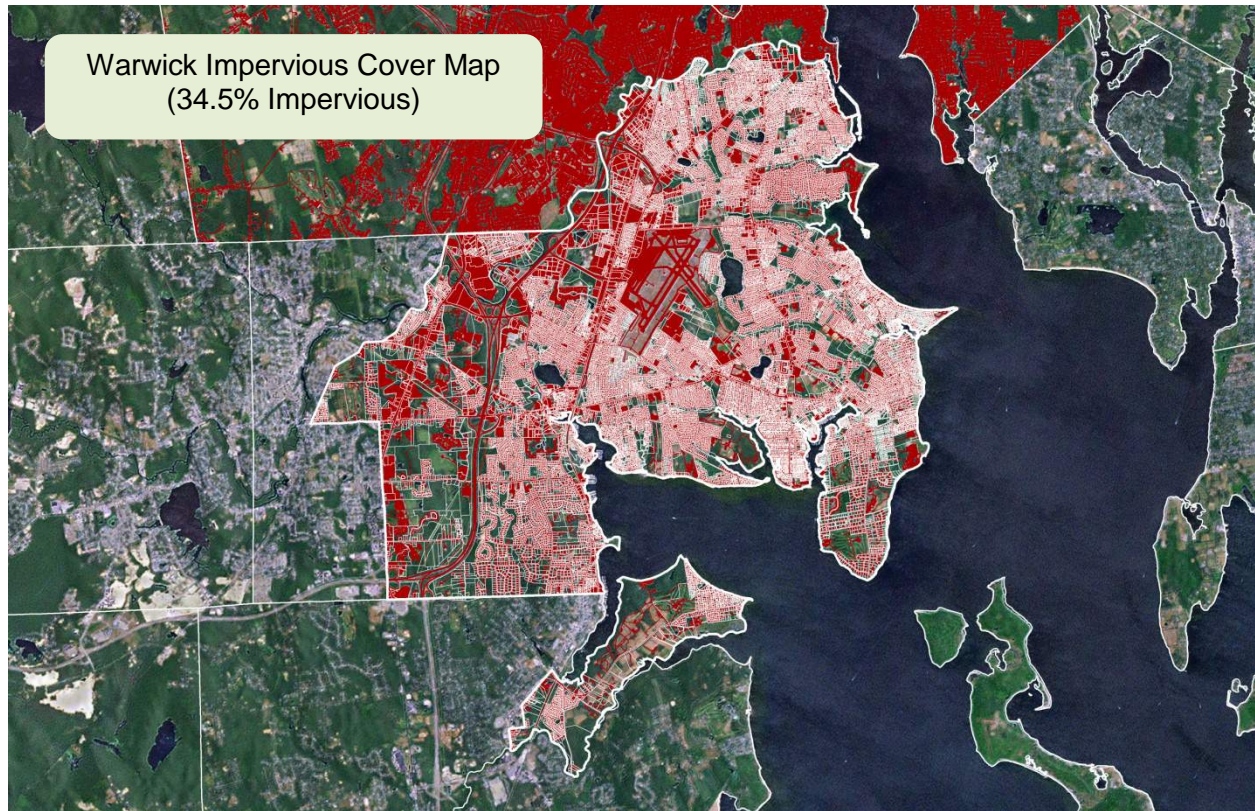
prevent local street flooding. The DPW sweeps all streets in the City 3-4 times a year, when funding permits, and some of the downtown areas are swept more often.

The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff stated was dedicated to stormwater (i.e., 32% MS4 system). This estimate considered the effort and cost associated with management of the CSS and MS4 systems. This information was organized by major cost centers to be consistent across the study area, as summarized in **Table 2.17** below.

Table 2.17 Providence Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	\$70,129	Labor for DPW administration
<i>Indirect Cost Allocation (20%)</i>	\$224,390	% total budget
Operations and Maintenance	\$899,112	Labor across multiple depts., materials & expenses
Engineering and Master Planning	\$107,262	Labor across multiple departments
Regulation/Enforcement	\$45,450	Labor across multiple departments
Capital Improvement Projects	\$0	None conducted, periodic grants only
<i>Major Capital Projects</i>	\$0	N/A
<i>Minor Capital Projects</i>	\$0	N/A
Water Quality Monitoring	\$0	None conducted
Total	\$1,346,343	

2.8 Warwick



The City of Warwick is approximately 35.9 square miles in area. The City is mostly composed of forest, roadways, and residential areas. **Table 2.18** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.18 Land Use in Warwick

Land Use Type	Percent Coverage in Warwick
Medium High Density Residential	24.9%
Deciduous Forest	17.7%
Water	13.3%
Roads	11.5%
Commercial	6.7%
Medium Density Residential	3.9%
High Density Residential	3.5%
Developed Recreational	3.2%
Airports	2.7%
Mixed Forest	2.2%

Land Use Type	Percent Coverage in Warwick
Industrial	2.0%
Institutional	1.4%
Other	7.0%

Leadership/Governance: Warwick has a Mayor and City Council form of government. The current mayor is Scott Avedisian and the City Council is composed of nine members representing nine wards.

Population: According to the Rhode Island Department of Labor and Training the 2000 census reported a population of 85,880 and the 2010 census reported a population of 82,672 in the City of Warwick. This represents a 3.7% decrease in population over the ten year span.

Economic Condition: The 2014 City budget indicates that the City is in relatively good financial condition, noting “Warwick has weathered the economic crises far better than many other cities and towns.” The City has reported a surplus in 12 of the last 13 years.

Key Industry: Key industries in Warwick include air transportation, hotels/lodging (TF Green Airport is located in Warwick) and retail shopping. Warwick is home to two regional shopping malls: the Warwick Mall and the Rhode Island Mall, as well as a large area of commercial development along Bald Hill Road.

2.8.1 Stormwater System & Local Issues

Warwick has a fully separate storm sewer system and nearly 100% of the system is mapped on paper. Approximately 30% of the system is mapped in GIS. Staff report that the system was built as a separate system and was never combined. The City estimates it includes approximately 450 miles of road, 3,000 catch basins, 1,000 manholes and 800 outfalls.



Warwick Wastewater Treatment Plant under water. Photo courtesy: City of Warwick DPW.

Funding Sources: Funding for stormwater management is through the general fund.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City, in order of priority:

- Flooding problems & preservation of property value
- Ecological concerns: minimize beach and shellfish closures (e.g., Greenwich Bay)
- Aging infrastructure & maintenance of infrastructure
- Regulatory compliance

City staff indicated that the floods of 2010 had a major impact on the City similar to that in the City of Cranston. As discussed previously, in March 2010, after five inches of rain, the Pawtuxet River overflowed and impacted many sites such as the Warwick Mall. Additionally, the City's wastewater treatment plant was completely inundated during the flood.

The following concerns for implementing a regional stormwater utility in Warwick were identified, in the following order of concern:

- Building a bureaucracy – “one new fee” and “fee creep”
- Responsiveness to and prioritization of local issues
- Consistency in treatment, fairness – “getting my share”
- One area “bailing out” another one – “taking on other people’s bigger problems”
- Being dominated by one entity

Public Awareness: Stormwater and water quality outreach and education efforts in the City of Warwick include:

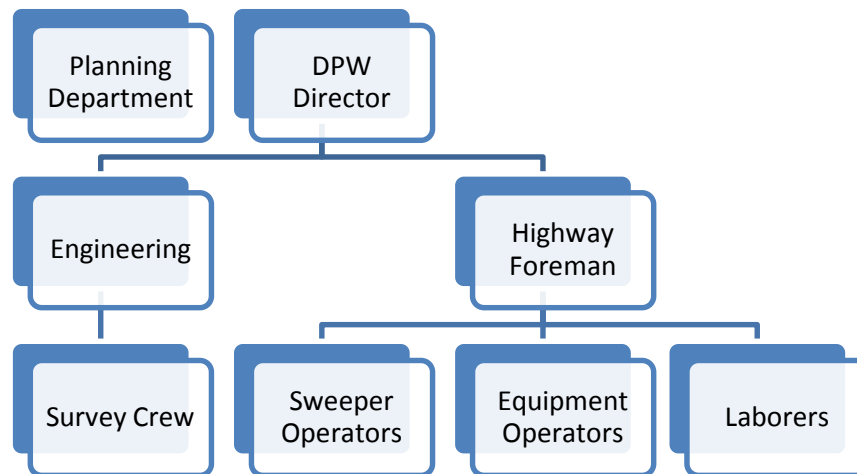
- DPW created an informational brochure to inform the public about the benefits of improving water quality, the steps currently being taken, and what the public can do to assist. Brochures will be distributed at City Hall, libraries, recreation facilities, and other public areas.
- Buckeye Brook Coalition – the City is working with the Buckeye Brook Coalition on a plan for implementing the recommendations of the RIDEM 2007 TMDL study. DPW is also working to establish a team of volunteers to assist with storm drain inspections, monitoring and to educate residents in the Buckeye Brook Watershed.
- DPW assists various Neighborhood Associations with collection of wastes after volunteer clean-ups.
- DPW maintains pet waste stations at several locations throughout the City.
- The City of Warwick Recycling Calendar is sent to every home owner in the City to inform residents of how to properly dispose of household and yard wastes.

City staff reported the overall stormwater awareness in the general population to be fairly low, but there is a moderate level of awareness for specific issues, such as flooding, beach closures and shellfish closures (e.g., Greenwich Bay). The following sensitive issues were noted: rate affordability; no new taxes or fees; and flooding issues.

Available Data: The City of Warwick has paper maps of nearly their entire storm sewer system including outfalls, catch basins, etc. GIS data for the stormwater system are limited (30%) and the City does not have an impervious cover layer. As a result, the updated Statewide Impervious Cover layer was used for Warwick. A GIS parcel layer was acquired from RIDEM containing land use attributes for each parcel. The Tax Assessor's database was not used during this study to evaluate data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.8.2 Program Management & Level of Service

Management of the stormwater program in the City of Warwick primarily falls under the Department of Public Works and Engineering Department. The DPW and Engineering Department coordinate with staff in the Planning Department, but these staff do not have a significant role in stormwater management. An organizational chart for management of the stormwater program is provided below.



The MS4 system in Warwick requires a significant effort for operation and maintenance. Approximately 900 (30%) catch basins within the City are cleaned annually and all streets are swept at least once annually. A catch basin cleaning and inspection form is completed and the City is planning to sweep more sensitive areas twice a year. The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.19** below.

Table 2.19 Warwick Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	\$6,429	DPW Labor
<i>Indirect Cost Allocation (20%)</i>	\$90,219	% total budget
Operations and Maintenance	\$188,681	Labor & expenses across multiple departments
Engineering and Master Planning	\$155,687	Labor & expenses across multiple departments
Regulation/Enforcement	\$9,663	Labor for Building Inspection Department
Capital Improvement Projects	\$89,434	None conducted
<i>Major Capital Projects</i>	\$37,434	Debt service on drainage bonds
<i>Minor Capital Projects</i>	\$52,000	Minor drainage repairs & rehabilitation
Water Quality Monitoring	\$1,200	Beach testing
Total	\$541,313	

2.9 Narragansett Bay Commission

As discussed previously, the NBC's focus is wastewater collection and treatment at the Field's Point and Bucklin Point Wastewater Treatment Facilities. NBC serves over 360,000 residents and 7,700 businesses in ten Rhode Island communities in the metropolitan Providence and Blackstone Valley areas. The service area incorporates the combined sewer system (CSS) for stormwater and sanitary sewer in areas of Providence, Central Falls and Pawtucket. The following recent and significant accomplishments have occurred as they relate to the CSS and stormwater management:

- 1998: RIDEM approved a Three-Phase Program that will eliminate or provide treatment of NBC's CSO discharges.
- 2001-2008: NBC constructed the Main Spine Tunnel and other CSO facilities, and the CSO Phase I Facilities became operational in October 2008. Overflow volumes have been reduced by approximately 50% as a result of these improvements and the CSO tunnel has captured over 5.64 billion gallons of flow since 2008 (source: Tom Uva, NBC).
- 2011: NBC commenced construction of Phase II of the CSO Program, which includes two near surface interceptors (along the Woonasquatucket and Seekonk Rivers) to bring additional flow to the Phase I tunnel, sewer separation on the East Side of Providence, and a constructed wetlands in Central Falls.
- 2014: NBC began the reevaluation of Phase III of the CSO Program.

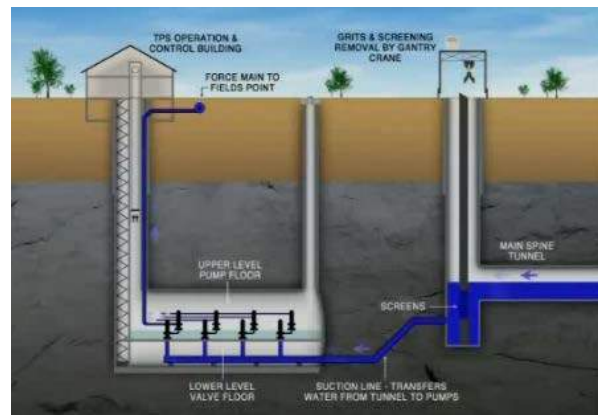


Illustration of the NBC Main Spine Tunnel (source: NBC video "The Biggest Project You'll Never See")

As part of its CSO Program, the NBC has developed an approach for stormwater mitigation that encourages developers to use low impact development (LID) techniques to reduce stormwater flows and create more capacity in the CSO tunnel. Under this approach the following factors are considered: NBC regulates connections to the sanitary sewer system and CSS; and for connections to the CSS, a Stormwater Mitigation Plan is required. During the period of 2003 to 2012, this approach resulted in 105 approved stormwater projects that have mitigated over 6.5 million gallons of stormwater from the NBC sewer system based on a single three month storm event (1.65 inches). Among other activities, the NBC conducts water quality monitoring at numerous bay and urban river sites in the UNB study area for nutrients and pathogens.

The NBC plays a significant role in stormwater management in the UNB study area, but it only controls new connections to the sewer system or CSS and the NBC does not operate or maintain the CSS lateral infrastructure (collection system). Section 4.1 discusses the regional stormwater management approaches considered during the Phase I Study and Section 4.2 discusses the need to maintain the CSS laterals, which include a potential role for the NBC to manage the CSS laterals. NBC's role in a regional stormwater program warrants further review during the Phase II Study, specifically the benefits of a regional green infrastructure program.

3.0 Compelling Case for Enhanced Stormwater Programs

This section discusses the importance of making a compelling case when considering a stormwater utility and the information that was considered by both the Steering Committee and the Stakeholder Group. Commonly utilized “drivers” are called out and examples that were voted most relevant to the study area by participants are highlighted. Section 2.0 identified compelling issues in each community with specific examples and this section represents the thought process for creating a compelling case and summarizes the collective feedback from the Steering Committee and Stakeholder Group.

3.1 Drivers for Change

Understanding the stormwater issues and concerns that face the Upper Narragansett Bay region is the starting point for building a “compelling case for action”. In every community there may be good, even compelling, reasons to improve the way stormwater programs are executed. When we look at stormwater programs around the country and identify the impetus for improved stormwater programs, we have found that the reasons for change are generally motivated by some combination of key common “drivers” or forces. Each of these drivers can be understood and expressed in various ways depending on the local situation; the generic categories are provided below with examples.

Water quality and ecology: beach and shellfish bed closures; nutrient-impaired embayments and recreational waters; fish kills; reduced ecological health; reduced number of game fish and destroyed habitat; toxic pollution; eutrophication of lakes and ponds; bacterial pollution; illicit connections and illegal dumping; combined sewer or sanitary sewer overflows, or other point discharge issues; urban hot spot pollution.

Quality of life and aesthetics: degrading water quality near beaches and subsequent loss of tourism; detention basin safety hazards or appearance; weeds, erosion or other stream impacts; loss of natural appearance; desire for greenways or trails; toxic or dangerous organisms that can effect human health and safety, and curtail recreational use.



Preservation of property value: reduction in waterfront property values; floodplain property values declining; opportunities for waterfront enhancement; loss of reputation for safety or for natural features; development pressures eroding natural features; protection of unique water-related features.

Drinking water supply protection and enhancement: pollution of groundwater and drinking water supplies; well head pollution issues; filling of reservoirs; eutrophication and water taste issues; declining low flows for water treatment; effluent pollution.

Flooding problems: flooding along both major and minor streams; system backups and other capacity issues; tidal influenced flooding; culvert and other conveyance infrastructure under sizing or failure.

Aging infrastructure: limited life and need to replace leaching facilities; clogged systems; erosion of property; damaged systems; rusted culvert inverts; cracked and failing concrete; undersized systems due to new development; failing dams and detention ponds.

Development pressures: development related increased flows and flooding; filled detention ponds; increasing pollution and erosion.

Erosion of channels and creeks: major stream erosion; bridge undermining; infrastructure failure due to erosion; minor ditch erosion; head cutting; sediment buildup; filling lakes and ponds.

Regulatory mandates: RIPDES permit (including anticipated requirements of renewed MS4 general permit); FEMA regulations; TMDLs; endangered species act; drinking water protection; well head protection; wetlands permitting; other state, regional, or local regulations.

Lawsuits: flooding caused by roads; environmental compliance law suites; nuisance flooding; erosion or other issues; health and safety suits.

UNB Regional Drivers

During the first meetings, the Steering Committee and Stakeholder Group identified the key issues and concerns that participants felt were compelling reasons (needs) they could address through an enhanced stormwater program if they had an adequate source of revenue. Responses were tallied by the Project Team for the major categories listed in **Table 3.1** and the Meeting #1 summaries in Appendix IV provide a more detailed breakdown of the issues and voting. Additionally, **Table 3.2** provides a summary of the sub-categories that comprise each of the major issues to provide a better understanding of the types of issues each group identified and how they were sorted by the Project Team into “buckets” such as “Policy” or Water Quality”.

Table 3.1 Compelling Case Voting Summary

Stakeholder Group			Steering Committee		
Rank	Category	Votes	Rank	Category	Votes
1	Policy	29	1	Water Quality	26
2	Education	25	2	Flooding	26
3	Flooding	20	3	Infrastructure	24
4	Cost Related	18	4	Policy & Administration	11
5	Social & Land Use	15			
6	System	13			
7	Water Quality	11			

Table 3.2 Compelling Case Sub-Categories

Major Category	Stakeholder Group Sub-Categories	Steering Committee Sub-Categories
1. Policy & Administration	Zoning and other hurdles Connect infrastructure & land use Incentives Enforce rules we have – variances Ease of Access Inconsistent criteria Uncontrolled infill One stop for everything water HOA defunct*	Enabling legislation exemptions (for a stormwater utility district) Prevention & education Inconsistent standards (NBC, Cities, RIDEM Manual)
2. System/ Infrastructure	Maintenance Navigation and sediment	Aging infrastructure Asset management (understanding infrastructure) Identification and prioritization of issues Maintenance of minor systems
3. Water Quality	Ecology Help regional compliance Fertilizer and pesticides Septic tank pollution* EPA Requirements*	TMDLs and future needs Water quality treatment is not done Recreation, quality of life, beaches Incentives for green infrastructure Under-drains for sanitary sewers (discharge to water bodies) Standards are too high (implying water quality goals) Compliance (RIPDES Permits) Ecology and water quality impacts*
4. Flooding	Flooding Water as a resource Regional disaster planning Climate change FEMA program interaction	Flooding streets Handling of roads (e.g., RIDOT) Flood mitigation Development impacts
5. Cost Related	Financial positives of this We spend a lot now Weary and wary of government Cost effectiveness Out of money Mudflat views (shellfish impacts) Affordability*	N/A
6. Social & Land Use	Positive health aspects Loss of redevelopment land Loss of historic properties At risk population issues	N/A
7. Education	Education Benefits of green even with grey Frame the argument well Overcome apathy Invisible problems	N/A

*These sub-categories were identified as potential issues or concerns, but received no votes.

“Compliance with RIPDES Permits” did not rate high as compared to the other stormwater management categories. This is a very important distinction to make when framing the compelling case and supporting rationale for an enhanced stormwater management program and implies that **there are real stormwater needs that communities need to address, not just because the “RIPDES MS4 Permit requires it”**. In the same breath, each community needs to remember that TMDLs have been developed for numerous water bodies in the UNB study area. These TMDL studies outline specific activities that are required to be completed. A summary of these activities by community is provided in Appendix I.

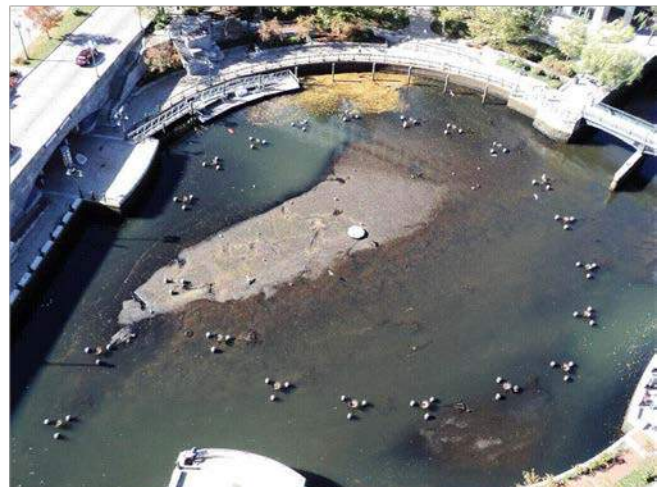
Where stormwater is found to be contributing to water quality impairments, the RIPDES MS4 General Permit requires the regulated municipalities to implement the recommendations of the TMDL study. TMDL requirements become effective once the MS4 operator is notified by RIDEM that the TMDL has been approved and contains provisions that must be addressed in a revised Stormwater Management Program Plan (referred to as a TMDL Implementation Plan). These requirements generally include:

- Targeted public education and outreach activities;
- Detailed mapping, investigation and condition assessment for MS4 infrastructure;
- Litter and pet waste management programs;
- Increased pollution prevention activities (e.g., more frequent street sweeping);
- Illicit discharge detection and elimination activities to remove pollutant sources; and
- Capital construction projects for installing structural BMPs to treat stormwater.

It makes sense to address needed infrastructure issues that are also impacting water quality and an enhanced (and adequate) stormwater program is the intended outcome of the RIPDES MS4 Permit. The estimated level of effort to meet the RIPDES MS4 Permit for the next permit cycle (anticipated 2015-2019) was considered in the development of the future stormwater program costs for each community, as discussed in Sections 4.2 and 4.3.

3.2 The Compelling Case for a Regional Approach

Determination of whether there is a “compelling case” for change is an initial step in framing the key reasons for change with respect to enhancing service delivery and establishing dedicated funding to improve the stormwater program. Now that the UNB municipalities have initially identified the drivers for change, the next step is to use this information to develop a compelling case. This compelling case serves as the municipality’s publicly-stated rationale for why an enhanced stormwater management program is needed and a



Sediment deposits at Waterplace Park in Providence.
Source: RIDEM

regional approach with funding through a dedicated stormwater user fee, may be the most appropriate and effective strategy.

As discussed previously in this Phase I Report, there are multiple compelling reasons to develop a regional approach for stormwater management and funding. This information is consistent with the key concerns identified by the Steering Committee and Stakeholder Group, as summarized below:

- **Flooding Problems:** the Pawtuxet River, Pocasset River and Woonasquatucket River regularly flood and have significantly impacted the communities of Cranston, Warwick, Providence and North Providence. A regional program would provide for consistent flood mitigation across the region.
- **Water Quality Issues:** the Blackstone, Ten Mile, Woonasquatucket and Pawtuxet Rivers as well as Upper Narragansett Bay and Greenwich Bay all suffer water quality impacts from stormwater runoff. In order to restore the quality of these waters and protect the recreational and commercial uses that are dependent upon improved water quality, actions need to occur across the contributing watersheds that span multiple municipalities.
- **Lack of Individual Specialized Resources:** many communities do not have trained staff or adequate resources for detailed infrastructure assessment to adequately evaluate drainage needs, conduct water quality sampling, and investigate stormwater improvements to address the RIPDES MS4 permit and TMDL requirements. An adequately funded regional program can more cost-effectively establish in-house technical capacity or contract out for the services needed to address local needs.
- **Interconnected and Aging Infrastructure:** the drainage systems in nearly all communities are interconnected with adjacent communities and/or the Rhode Island Department of Transportation (RIDOT). Correcting a flooding or water quality problem often requires that multiple entities “fix” their system and coordination among independent departments can be very difficult. The delineation of drainage systems and combined sewer systems in the communities of Pawtucket and Providence are poorly defined and the management of this infrastructure has an impact on the Narragansett Bay Commission’s interceptors and overall operations.

During the last meeting for this study, several of the members of the Stakeholder Group volunteered to participate in outreach to their colleagues and other community leaders in order to help explain the case for a regional approach to stormwater management. **Water quality, flooding, policy and education issues received the greatest number of votes as the most compelling reasons to improve stormwater management.** The study participants provided examples of stormwater issues that support the need for changing the current status quo. The study participants also discussed a “no action” alternative/option, understanding there are consequences for such an approach. The most compelling reasons to improve stormwater management in each of the study area communities are summarized in **Table 3.3**.

Table 3.3 Compelling Case Summary by Community

Municipality	Flooding	Preservation of Property Value	Water Quality & Ecological Concerns	Aging Infrastructure	Compliance Requirements	Quality of Life & Aesthetics	Development Pressures
Central Falls				✓	✓	✓	
Cranston	✓	✓	✓	✓			✓
East Providence	✓		✓	✓		✓	
North Providence*							
Pawtucket	✓	✓		✓	✓	✓	
Providence	✓		✓	✓	✓		
Warwick	✓	✓	✓	✓	✓		

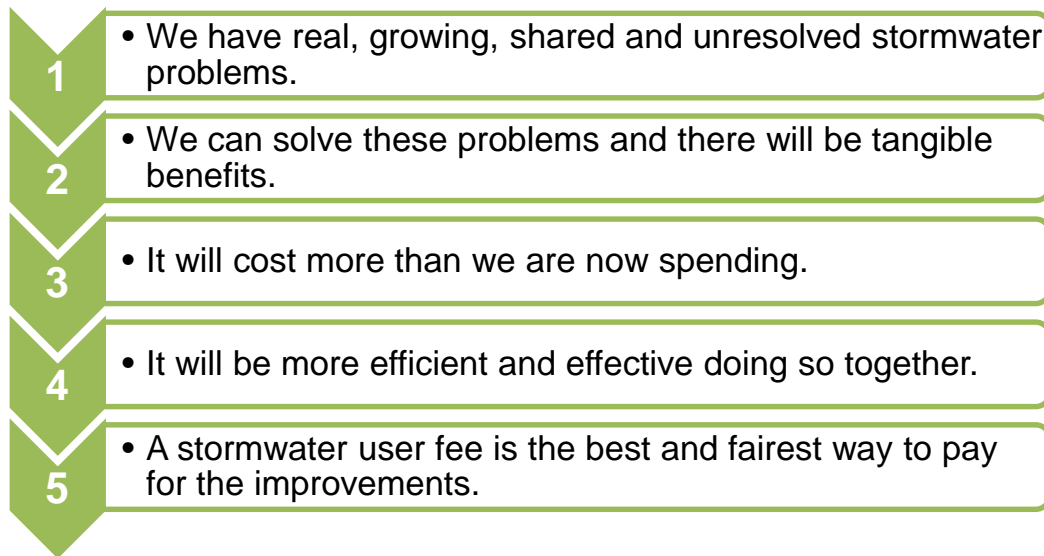
Note: *North Providence did not participate in a one-on-one meeting with the Project Team or provide compelling case information.

Section 4.1 discusses the feedback from the Steering Committee and Stakeholder Group meetings regarding a regional approach to manage and fund the stormwater program. In general, the Steering Committee felt that **a regional stormwater management and funding approach is the “best among options”** and the Stakeholder Group voiced strong support for a regional approach with several members even stating that it was the only way that the region’s stormwater problems would be resolved.

3.3 Key Messages

The impetus for this study was a local understanding that there is inadequate funding to address known stormwater issues and a regional solution may be an effective strategy to address these issues. While there are many competing interests and issues for funding across all of the study area communities, there is a need to invest in a more robust stormwater management program and avoid future costs associated with flooding, aging infrastructure and water quality degradation.

The following **logical argument** was developed during the study to summarize the thought process and key messages to the greater public:



Key Stakeholder Group Messages: at the last meeting the Project Team asked the Stakeholder Group to reflect upon the study with the following questions in mind:

1. *What resonates most to you based on what you've heard so far?*
2. *What are the most meaningful results of this preliminary feasibility study?*

The Project Team summarized the following key themes from the discussion:

- Regional Concept is Needed
- **Education is Key** (lack of understanding, “how to best solve”)
- Need Good Data/Program
- Emphasize Infrastructure Needs
- Regional Entity Needs to be an Effective Problem Solver
- Defined and Dedicated Resources/Responsibilities
- Different Concept – Must Sell Well
- Need a Strong Compelling Case (*and consequence*)

Each of the above themes are touched upon in this report and incorporated into the recommendations/next steps.

3.4 Public Education and Outreach Considerations

Heightening public awareness and understanding of why a change is needed in service delivery and management is critical to gaining support for a stormwater user fee. The communities in the UNB study area agreed that the public is in general not aware of water quality issues, the ever-increasing costs of stormwater management, how stormwater management can be funded and the benefits that will accrue from an adequately funded stormwater management program. Engaging and providing the public with information about the issue will enable rate payers to make an informed decision when presented with a compelling case to support program change and new funding methods.

As the project moves into Phase II of the Upper Narragansett Bay Regional Stormwater Management Initiative, a comprehensive public education and outreach plan should be developed that all Steering Committee/Stakeholder Group members can use. The first step in the public outreach will focus on public education on the issue. This will be followed by building the compelling case. Knowing when, how, and to whom the case for a regional stormwater utility should be presented is more of a political and technical art form than it is a science, and will require input from and coordination with the Steering Committee and Stakeholder Group who have local knowledge of and experience with stakeholders. A successful public education and outreach plan will generally include the following elements:

- Key talking points that focus on the benefits of a regional approach
 - Answers the “why” and “why now” questions (stormwater infrastructure investment is always something that is put off until tomorrow)
- Presentations
- Honest assessment of the challenges, costs and fees.
- Testimonials and case studies from other regional success stories.
- Media relations at the local, regional and state level
- Social media
- Meetings and events
- Grasstops and grassroots (e.g. state-level education and advocacy with elected officials and key agencies, environmental and nontraditional “voices”)
- Materials that can be customized to each community
- A recommended timeline

Ongoing communications consultation with each individual municipality will be required to customize their approach. This will entail thinking through the communications process, communications vehicles and timing that are best for them based on the political environment, issues and stakeholders in their city/town. For example, the following questions are among those that should be addressed by each community in the formulation of their customized approach:

- Who are the potential champions/foes of a project like this?
- Who are all the key stakeholders in the municipality?
- In which order should we meet with stakeholders? Who attends the meetings?
- What are the key stormwater issues in each municipality and how will a regional approach help solve them?
- What visible projects will happen and what will be the benefits?
- How have other similar measures been approached in the community? How did they fare?
- What successful and unsuccessful approaches have been used in the past?
- What messages are apt to best resonate with residents? Businesses?
- What are the best ways of getting the information to the various stakeholder groups?
- How often should information be conveyed?

4.0 Proposed Future Stormwater Program

This section provides an overview of potential regional stormwater management approaches with a more detailed discussion of a preferred regional approach by the Steering Committee. A level of service and cost estimate are provided for the future stormwater programs in the study area. A preliminary revenue analysis is provided to consider a stormwater utility funding mechanism, followed by a brief discussion about credits to illustrate one of many future policy decisions that need to be made under the next phase of study.

4.1 Regional Approaches Considered

The Steering Committee was asked to narrow the universe of options to one preferred regional approach to be considered for further evaluation in this initial feasibility study. The Project Team developed a suite of regional programs considerations, potential regional frameworks, assumptions, and objective criteria that were presented to the Steering Committee with an explanation of each. “Regional” stormwater programs were described and discussed in the context of 3 essential building blocks:

- A. **Regional Program Management:** activities are done together and/or consistently across the region with consideration of the varying MS4 and CSS systems. The Project Team provided several potential regional program approaches with a combination of the following five program elements:
 1. Combined Sewer System (CSS) lateral collection systems
 2. Water quality programs
 3. Municipal Separate Storm Sewer (MS4) collector systems & local flooding
 4. Streams and floodplain management
 5. Stormwater review and support for development

The Steering Committee was then asked to consider their preference for how each of those above 5 elements should be handled: regionally or locally. The preliminary approaches focused on preferences for regional program management.

- B. **Regional Organization:** work is done or administered by multiple cooperative entities, an existing entity or a new “regional entity”. The NBC’s potential role in the organizational structure was reviewed and relevant discussion is provided following the review of preliminary regional approaches. Regional organization preferences included options for either “NBC” or “Regional” as the regional entity in which “Regional” would be a new, separate regional entity.
- C. **Regional Funding:** programs across the region are funded using a consistent or similar approach, such as a stormwater user fee (aka “utility”). For simplification purposes, fees were assumed to be collected regionally but redistributed to the communities for implementing “local” options. The Steering Committee voiced concern about the

complex allocation of funds and expressed a desire to ensure that each participating community got value back.

The Project Team emphasized that although one preferred regional approach would be considered for further evaluation, the approach may be transitional and not permanent to accommodate changes and growth over time. The Project Team provided seven potential regional frameworks with varying combinations of program elements managed by either a “Regional” or “Local” Entity. The preliminary approaches presented to the Steering Committee are summarized in **Table 4.1**.

Table 4.1 Preliminary Regional Approaches Considered by the Steering Committee

Approach	#1 CSS Laterals	#2 Water Quality	#3 MS4 Collector & Flooding	#4 Streams & Floodplain Mgmt.	#5 Stormwater Review
A Regional	Local	Regional	Regional	Regional	Regional
A1 Regional	NBC	Regional	Regional	Regional	Regional
A2 Regional	NBC	Regional	Regional	Regional	Local
B Regional/local	NBC	Regional	Regional	Local	Local
B1 Regional/local	NBC	Regional	Local	Local	Local
C NBC/local	NBC	NBC	NBC	Local	Local
C1 NBC/local	NBC	NBC	Local	Local	Local

These seven regional framework approaches are further explained herein.

Approach A: Regional

- Local governments manage program element #1-CSS laterals, where they exist, explained as everything up to the interceptors.
- Regional entity responsible for all of the other four program elements (#2 through #5).
- Local governments would have little stormwater responsibility.

Approach A1 – NBC is Responsible for (#1) CSS Laterals

- Similar to Approach A, but Instead of local governments being responsible for (#1) CSS laterals, NBC would have responsibility for all CSS laterals operations and infrastructure.
- Regional entity would be responsible for all of the other four program elements (#2 through #5).
- Local governments would have little stormwater responsibility.

The concept where NBC would assume responsibility for the CSS lateral infrastructure has already been discussed between NBC and CSS communities.

Approach A2 – Local Community is Responsible for (#5) Stormwater Review

- Similar to Approach A1, but local communities maintain control of stormwater review (#5) to provide more local control and reduce burden on developers.
- NBC would be responsible for (#1) CSS lateral operations and infrastructure.
- Regional entity would be responsible for the other three program elements. (#2, #3, and #4)

Approach B: Regional/Local

- NBC would be responsible for (#1) CSS laterals operations and infrastructure.
- Regional entity would be responsible for (#2) Water Quality and (#3) MS4 collector systems (e.g. pipes, catch basins, man holes, outfalls, BMPs) and local flooding resulting from issues with infrastructure.
- Local governments would be responsible for (#4) streams and floodplain management and (#5) review of stormwater designs for permitting and development.

Approach B1 – Local Community is Responsible for (#3) MS4 Collector System

- NBC would be responsible for (#1) CSS laterals operations and infrastructure.
- Local governments would be responsible for their own (#3) MS4 system operations and infrastructure; (#4) streams and floodplain management and (#5) review of stormwater design and studies for permitting and development.
- In Approach B1, the regional entity is only responsible for (#2) water quality.

Approach C & C1: NBC/Local

- Similar to Approach B & B1, but NBC was recognized as the specific organization for the regional entity.

The following pros and cons were discussed by the Steering Committee for Approach A:

PROS	CONS
Takes the stormwater management burden off understaffed municipalities.	One more level for developers to have to go through for approvals. Could be overcome through a one-stop shop service.
Effective watershed planning for water quality and flooding.	Residents concerned about regional authority's responsiveness to local issues like flooding events.
Dedicated professional stormwater staff can provide technical support.	Additional overhead costs.
TMDLs addressed regionally.	Prioritization of projects may result in funding going to projects in other communities. Rate payers may not immediately see enhancements in service commensurate with the costs they incur.
Economies of scale – work and equipment shared means lower local operating costs.	Economies of scale may not address local projects.

The following pros and cons were discussed by the Steering Committee for Approach B:

PROS	CONS
More local control and flexibility.	Concern about fees being accurately apportioned to local towns.
More responsive to citizens.	Spending would be under the control of local councils, which could lead to continued funding challenges.

The following pros and cons were discussed by the Steering Committee for Approach C:

PROS	CONS
NBC already successfully runs a regional program and would have the requisite experience.	Currently, the NBC is only responsible for CSS transmission from the interceptors to the plant. Adding responsibility for CSS laterals could impose an additional cost recovery and management burden.
NBC already has a billing system and administrative support. Wet weather fee component can be added.	Not all the communities involved in this regional feasibility study use NBC for their wastewater treatment. What would be the perception of those users if they receive a bill from NBC?
Integrated approach for water quality.	NBC does not currently have the regulatory authority to manage stormwater.

Discussion of NBC Role as Regional Entity

In addition to the pros and cons of NBC taking on the role of a “regional entity” under Approach C, the Stakeholder Group discussed the following important question: Can we build on NBC instead of creating a separate program? The following key points were discussed:

- The NBC is already a regional entity. It is respected, well run and their program incorporates stormwater management for areas that drain to NBC interceptors.
- NBC just raised their rates and won't want to add another fee.
- The CSO initiative (long-term control plan) is demanding on NBC staff.
- NBC does interceptors and treatment. Smaller pipes belong to communities.
- NBC does permitting for projects.
- NBC handles large infrastructure and may not be willing to take on lots of smaller projects, as well as operation and maintenance.
- NBC is not currently authorized to charge a stormwater fee.
- Local communities still have to deal with flooding issues and NBC is not well equipped to handle these types of issues.

In the recent past, NBC offered through the State legislature to conduct a study and report about the organization potentially taking over community wastewater collection systems within their service district. NBC did not want to force communities into this model if they did not want to participate. A legislative proposal was introduced but did not successfully pass through the General Assembly.

As far as NBC taking over the CSS laterals under the regional approaches discussed above, this would be less effort than taking over the entire NBC service area and would focus on the CSS systems in Central Falls, Pawtucket and Providence. However, this approach would also require legislative approval. See Section 4.5 for a discussion of the NBC's feedback on billing for a regional stormwater utility.

Approach D – “Do Nothing”

The Steering Committee also suggested an Approach D – “Do Nothing” in which all program elements remained local. The following information was provided in support of a “Do Nothing” approach:

- There are concerns about another fee for residents, particularly in economically challenged communities where people are already struggling to pay existing utility fees.
- Cities who are doing things well don't want to pay/support others who aren't.

Regional Approach “Straw Poll”

Following the review of preliminary options and a discussion of the pros and cons, the Steering Committee participated in a straw poll to rank each of the approaches from 1 – 5, with 1 being the least appealing and 5 being the most appealing. This ranking is displayed in the first column of **Table 4.2**. The approaches are presented in columns two through five. The results were given a weighted score by multiplying the number of votes by the rank. For example, Approach A received a score of 37 as follows: 1 x 1 vote = 1; 2 x 1 vote = 2; 3 x 2 votes = 6; 4 x 7 votes = 28 (1 + 2 + 6 + 28 = 37).

Table 4.2 Straw Poll Results for Regional Approaches

Appeal Factor (1=least, 5=most)	Approach A (# votes)	Approach B (# votes)	Approach C (# votes)	Approach D (# votes)
1	1	0	3	4
2	1	4	5	2
3	2	4	2	1
4	7	3	0	2
5	0	0	1	2
Totals	37	32	24	29

Based on the straw poll, Approach A was considered the most favored option, indicating that the Steering Committee desires a regional approach that reduces the local responsibility and effort.

- Approach A was advanced for consideration:
 - Local governments or NBC manage (#1) CSS laterals up to the interceptors.
 - A new regional entity (not NBC) would be responsible for all other elements.
 - Local governments would have little stormwater responsibility.

Once category A emerged as the favored type of framework, additional discussions were held to evaluate the nuances of A, A1, and A2 variations, and Approach A2 was considered to be the most favorable by the Steering Committee.

- Preferred Approach A2
 - NBC would have responsibility for all (#1) CSS infrastructure, including CSS laterals (everything up to the interceptors).
 - A new “regional entity” would be responsible for all other elements.
 - The new regional entity would collect a uniform fee for its services, calibrated to varying local needs.
 - Local governments would be responsible only for development related stormwater reviews within their respective jurisdictions.

During Steering Committee Meeting #3, the benefits of a regional entity were discussed in greater detail and participants felt that a regional entity could:

- Eliminate bureaucracy;
- Allow greater access to sources of specialized expertise;
- Prioritize projects within watersheds;
- Spread costs across a larger rate base; and
- Strengthen the ability to garner outside funding. It was also pointed out that there would be monetary benefits when applying for matching grants and other sources of revenue.

Using the preferred Approach A2, the Steering Committee members were asked what they felt a Regional Entity might do. Participants were given 2 votes for their top priorities and the results are summarized in **Table 4.3**. Capital program management and the operations of the MS4 collection system emerged as the two high priorities for a regional entity.

Table 4.3 Priorities for New Regional Entity

Top Duties for "New" Regional Entity	Votes (2/person)
1. Construction & Engineering	8
2. MS4 Collection System Operator	8
3. Compliance Manager	3
4. Information Manager	3
5. Floodplain Manager	1
6. Regulator and Inspector	1
7. Watershed Manager	0
8. Development Partner	0
9. Public Educator	0
10. Finance and Administration	0

The Steering Committee provided feedback about what they liked and did not like about the concept of regionalization. The following is a summary of the information discussed:

Likes about the Regional Approach

- Watershed wide approach.
- Consistency of funding.
- Municipalities could move stormwater off their plate.
- Consistency of services and solutions.
- Only way problem will be addressed (current approach isn't working).
- Consistent regulation/enforcement and inspection.
- Expertise fixing the problem.
- Service delivery consistency.

Dislikes about the Regional Approach

- Loss of control over system.
- Cities will be less accountable for stormwater issues.
- Cost is going to be significant – the entire program costs are significantly underestimated due to lack of detailed information.
- Fee creep.
- Public perception of a "rain tax".
- Unforeseen challenges (e.g., lawsuits, costs).
- Concerns about fair play and municipal priorities.

Following discussion of likes and dislikes about the regional approach, both the Steering Committee and Stakeholder Group were asked if this approach should be explored further. **Table 4.4** summarizes the results of the voting and indicates that the members felt that a regional user fee approach warrants further investigation.

Table 4.4 Voting to Continue Exploring a Regional User Fee Approach

Continue w/Regional User Fee Approach	Steering Committee Votes	Stakeholder Group Votes*
1 (Strong No)	0	0
2 (Don't Like It)	2	0
3 (Neutral)	3	0
4 (Best Among Options)	5	1
5 (Strong Support)	2	11
6 (Other/ No Vote)	0	0

Note: *one member left early.

Table 4.5 summarizes the Project Team’s review of the potential benefits of regionalization using Approach A2 and the current understanding of compelling issues in each community. Benefits are color-coded according to their potential to provide a positive benefit to address community specific needs. See Section 4.4 for additional information regarding the future program cost and regional considerations.

Table 4.5 Qualitative Summary of Regionalization Benefits Using Approach A2

Municipality	Flooding	Preservation of Property Value	Water Quality & Ecological Concerns	Aging Infrastructure	Compliance Requirements	Quality of Life & Aesthetics	Development Pressures	CSS Laterals Operation & Maintenance
Central Falls				✓	✓	✓		✓
Cranston	✓	✓	✓	✓			✓	
East Providence	✓		✓	✓		✓		
North Providence*								
Pawtucket		✓		✓	✓			✓
Providence	✓		✓	✓	✓			✓
Warwick	✓	✓	✓	✓	✓			

Relative Benefit:		High
		Moderate
		Low

Note: *North Providence did not participate in a one-on-one meeting with the Project Team or provide compelling case information.

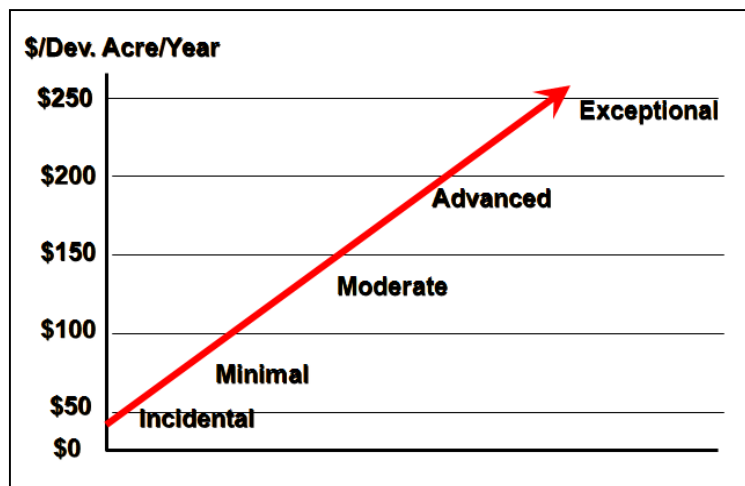
As outlined in Table 4.5 above, the regional Approach A2 has the potential to provide a relatively high benefit for communities in the Upper Narragansett Bay to address multiple compelling issues and stormwater management needs.

Additional Regional Approach: Upper Narragansett Bay Regional Clean Water Authority

During the development of the final report, the Consultant Team reviewed the results of Phase I Feasibility Study and feedback on the draft report to offer an additional regional approach for future consideration, as outlined in **Appendix VIII**. This approach proposes the concept of integrating the management of the CSS and separate sanitary sewer systems of Central Falls, Pawtucket and Providence, and the management of the MS4 systems in all of the six participating communities, under a single regional authority referred to as the “Upper Narragansett Bay Regional Clean Water Authority” (RCWA). The RCWA could potentially have two distinct operational divisions, namely the “*Sewer Collections Division*” and the “*Stormwater Division*”. This approach requires further evaluation during the Phase II Planning Study.

4.2 Level of Service

It is important to understand the needs or “level of service” for the future stormwater program as this will drive the cost and approach for funding and implementation. In the context of a regional management and funding approach, the level of service can also drive the organizational structure and rate approach. During the study, the Steering Committee noted that the level of service needed to be clearly defined across the region and that each municipality should be held to certain minimum standards.



Program Investment & Corresponding Level of Service

The figure to the right illustrates the typical investment (cost) per developed acre of land per year for stormwater programs with increasing levels of service. This is based on the Project Team’s experience with stormwater programs across the country and the service provided at various levels of investment. For example, communities that invest \$50-\$100/developed acre/year typically have a very minimal stormwater management program. Programs within the “moderate” range are generally considered to provide a level of service that adequately maintains the current MS4 system and incorporates a moderate effort to address priority stormwater management areas. **A moderate to advanced level of service should be the minimum starting point in the UNB study area given the current understanding of**

stormwater issues and the need to develop and construct capital projects to improve water quality.

The future level of service was estimated using available data, information provided by participating municipalities and best professional judgment by the Project Team. One of the most critical components necessary to gauge an appropriate level of service is a detailed understanding of the CSS and MS4 systems, specifically: age and condition of infrastructure; system capacity and the level of stormwater treatment provided. The Steering Committee and Stakeholder Group both noted at multiple meetings that the MS4 systems need to be assessed to determine the most appropriate level of service to be provided through a local or regional stormwater management program. Since this detailed information was not available for this study, the Project Team (with input from RIDEM) estimated a future level of service based on the following criteria:

- At a minimum, communities must demonstrate adequate progress towards meeting the requirements of their existing RIPDES MS4 Permit:
 - Implement the six (6) Minimum Control Measures
 - Perform maintenance and repairs of the MS4 to prevent failure
 - Conduct a planning analysis for impaired waters, focusing on those with TMDL studies
 - Design at least 1 BMP annually for impaired waters and/or TMDLs: this will develop “shovel ready” projects to seek/obtain alternative funding and/or leverage with upcoming redevelopment projects.
 - Construct at least 1 BMP in the first 5 years targeting an impaired water body: this is a reasonable goal for a municipal program given the upfront planning effort and timeline for design, permitting and construction. In subsequent years, the planning and design expenditures will shift to provide for more capital construction.
- The estimated effort, as a percent (%) increase from current efforts, with an understanding of the current level of service provided and needs stated by City staff.
- Future stormwater program estimates are for each community and do not assume a regional approach and associated economies of scale.
- The majority of the future program is funded through annual revenues to minimize debt service.

It is important to note that the data available for each municipality was insufficient to specifically determine the costs of future level of services that will result in compliance with MS4 permit requirements. Also, the estimate for the future level of service did not incorporate an analysis of the following components, which will increase future program costs that will have to be balanced with other competing interests in the region:

- Major capital expenditures to retrofit MS4 systems and meet all TMDL recommendations;
- Major MS4 system rehabilitation or “capital replacement” costs (due to lack of data); and
- Major capital expenditures for flood mitigation (not yet defined).

Estimates of average annual program expenditures for the next 5 years are provided in Section 4.3 and provide a comparative analysis based on a moderate level of service for similar communities across the country and the cost on the basis of developed acres for the UNB study

area communities. Additionally, the figures from the 2012 Rhode Island Clean Water Needs Survey is provided as a point of reference for TMDL stormwater compliance costs; however, these costs have not been evaluated specifically for the UNB study area communities.

CSS Lateral Infrastructure

The current and future level of service and costs associated with the CSS laterals (collection system) that discharge to the NBC interceptors were not evaluated as part of this Phase I Study, but the following information was noted:

- Very little information is available regarding the condition of the CSS infrastructure.
- NBC encounters issues with fats, oils and grease (FOG) clogs and sediment at interceptors due to the CSS laterals. NBC does not control the CSS laterals.
- Study participants felt that the effort to evaluate the CSS infrastructure should be handled separately from the MS4 program since it primarily impacts the NBC interceptors under a separate program. As indicated in the regional approach voting in Section 4.1, the favored approach included management of the CSS by the NBC.
- NBC has policies in place to manage stormwater in CSS areas and these areas are incorporated into the NBC's Long Term Control Plan for CSOs.
- The CSS infrastructure warrants further consideration as part of the Phase II study to evaluate the benefits of a comprehensive regional green infrastructure program to address CSS and MS4 areas. Also, see the additional regional approach discussed in Appendix VIII.

It is very important to understand that the CSS infrastructure still needs to be properly operated and maintained. The NBC and CSS communities indicate that the level of service for this infrastructure is not sufficient and additional funding is needed irrespective of who manages the infrastructure. This represents a cost that is above and beyond the MS4 program costs discussed in this Phase I Study.

Steering Committee Feedback

During the study, the Steering Committee noted that “the program needs to be affordable, utilize an integrated approach, and push back schedules for compliance. This is a new permit process so there will be changes over time.” Additionally, participants noted multiple times that “future needs and costs are not well understood and the future program and related fees under a stormwater utility appear to be dramatically underestimated.”

These are legitimate concerns considering the potential level of effort to address infrastructure needs within a specific timeframe given the ongoing level of investment in other public infrastructure, such as the sanitary wastewater and the combined sewer system in some communities. The Project Team emphasized that the program will take time to develop and priorities for infrastructure and funding will need to be balanced.

RIDOT Considerations

During the study, representatives from the RIDOT noted the important relationship of state roads and MS4 infrastructure in the UNB study area. This Phase I Study did not incorporate these infrastructure needs and costs, but the Project Team recognizes that the RIDOT needs to be considered as part of the regional stormwater management solution. The extent of RIDOT MS4 infrastructure in each of the study area communities is summarized in **Table 4.6**.

Table 4.6 RIDOT MS4 Infrastructure

Municipality	Roads (lane miles)*	Catch Basins*	Outfalls*
Central Falls	2.4	45	1
Cranston	136	669	58
East Providence	95.5	741	33
North Providence	34.5	337	33
Pawtucket	46.3	577	6
Providence	140.7	1134	53
Warwick	212.1	611	80
Total	667.5	4,114	264

*Notes: estimates are provided for RIDOT infrastructure only and the inventory for catch basins and outfalls is ongoing. Lane miles are for roads maintained by RIDOT, including ramps.

Due to concerns expressed by RIDOT during this study about the potential policy implications of a regional stormwater management and funding approach for the Upper Narragansett Bay, the project team offers the following points of clarification that warrant further consideration during the Phase II Study:

- The needs, costs and level of service identified under this study do not include RIDOT.
- The UNB study area community needs do not consider the interconnections with RIDOT; therefore, the program does not assume a cost or level of service related to RIDOT.
- No program costs or fees were evaluated for RIDOT infrastructure; therefore, fees collected in the UNB study area would not be used to pay for RIDOT infrastructure.
- It is worth considering an option to incorporate RIDOT infrastructure and costs into the regional approach. In this case, the Regional Entity could do one of the following:
 - Collect a fee for RIDOT infrastructure and assume responsibility for the assets under the regional program;
 - Collect a fee for RIDOT infrastructure and direct funding to RIDOT to maintain its assets to a level of service consistent with the regional program; or
 - Some combination of the above options as the regional program develops.

4.3 Future Cost Estimate

A preliminary analysis of future program costs was presented at Steering Committee Meeting #3 and updated following further review and discussion with the participating communities. The future estimated annual costs for the UNB study area communities are summarized in **Table 4.7** and represent a significant increase above current expenditures. Table 4.7 includes an initial estimate of the future program cost by the Project Team and an estimate based on a moderate-advanced level of service using a cost of \$175/developed acre for developed areas in each community, assuming that each community has no CSS system. In lieu of detailed future cost information an estimate like this helps to zero in on the probable range of future program cost. The future program costs were estimated using an assumed cost per developed acre so as to estimate costs based on a consistent level of program across all participating municipalities.

Table 4.7 Estimated Future Annual Stormwater Cost Estimate & Comparison

Municipality	Current Budget	Future Program* Initial Estimate	Future Program Assuming \$175/developed acre/year
Central Falls (97.2% CSS)	\$53,168	\$88,530	\$134,400
Cranston	\$1,354,073	\$1,635,193	\$2,562,560
East Providence	\$275,400	\$692,700	\$1,500,800
North Providence	\$117,847	\$499,853	\$649,600
Pawtucket (83.2% CSS)	\$135,743	\$446,544	\$974,400
Providence (68.3% CSS)	\$1,346,343	\$3,315,647	\$2,072,000
Warwick	\$541,313	\$1,094,347	\$3,180,800
Totals	\$3,823,887	\$7,774,814	\$11,074,560

Note: *as determined by municipal officials.

It is important to note that the current level of service is minimal in most communities, although some communities have significant CSS systems. The cost difference may be even greater once more data is available and future needs are better understood.

It appears that the future level of service and annual cost for the UNB study area is at least in the range of \$7.8-11 million, but may be even higher once additional infrastructure data is available. **Table 4.8** provides a more detailed breakdown of the estimated annual future stormwater program costs by key cost center. A summary of future costs with assumptions for each community are provided in **Appendix IX**.

TMDL Compliance Costs – 2012 Rhode Island Clean Water Needs Survey (CWNS): the 2012 CWNS was completed in January 2013 by Woodard & Curran and LimnoTech on behalf of the RIDEM to document wastewater and stormwater needs in Rhode Island. A copy of the CWNS is provided in Appendix IX. Stormwater needs and costs were evaluated as they relate to TMDL requirements for 16 stormwater “facilities” based on the following major assumptions:

- *The volume of stormwater that must be treated to address TMDL requirements is represented by the water quality volume (1 inch of runoff) of impervious surfaces in the catchment areas of priority outfalls.*
- *The cost per cubic foot to treat the required “water quality volume” of stormwater is based on BMPs implemented in Rhode Island and the volume of runoff they treat. The average cost of the BMPs that have been implemented in Rhode Island is \$12 per cubic foot of stormwater treated.*

The estimated cost for the 16 stormwater facilities is \$58.3M for specific project locations and types, including: stormwater conveyance systems; stormwater treatment; green infrastructure; and stormwater management programs. The following stormwater facility examples are outlined below as they relate to the UNB study area:

- \$9,551,287 – Warwick Stormwater Abatement
- \$8,666,160 – Cranston Stormwater Needs
- \$295,275 – North Providence Stormwater Management
- \$2,651,803 – Providence Stormwater, Mashpaug Pond
- \$3,171,018 – Providence Stormwater Management

The costs to meet all TMDL requirements in each of the UNB study area communities has not been evaluated and it would be inappropriate to apply the CWNS cost estimate methodology to the total impervious area within the study area since not all drainage areas or impervious surfaces require treatment and/or the same level of treatment. This information needs to be evaluated further as part of the Phase II Study.

Table 4.8 Estimated Future Annual Stormwater Costs by Key Cost Center*

Key Cost Center	Totals	Central Falls	Cranston	East Providence	North Providence	Pawtucket	Providence	Warwick
Administration	\$173,498	\$9,406	\$28,205	\$18,000	\$22,500	\$1,589	\$84,155	\$9,643
<i>Indirect cost allocation (20%)</i>	\$1,293,969	\$14,755	\$272,532	\$115,450	\$83,309	\$74,424	\$552,608	\$182,391
Operations & Maintenance	\$3,708,821	\$64,370	\$804,827	\$235,500	\$141,500	\$109,432	\$2,023,002	\$330,191
Engineering & Master Planning	\$719,408	\$ -	\$39,841	\$89,750	\$32,500	\$75,000	\$212,708	\$269,609
<i>BMP Design</i>	\$300,000	\$ -	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Regulation/ Enforcement	\$113,640	\$ -	\$14,788	\$7,500	\$7,500	\$11,099	\$68,174	\$12,079
Capital Improvement Projects**	\$1,190,434	\$ -	\$375,000	\$125,000	\$125,000	\$100,000	\$275,000	\$190,434
<i>Major Capital Projects</i>	\$837,434	\$ -	\$300,000	\$75,000	\$75,000	\$75,000	\$200,000	\$112,434
<i>Minor Capital Projects</i>	\$353,000	\$ -	\$75,000	\$50,000	\$50,000	\$25,000	\$75,000	\$78,000
Water Quality Monitoring	\$264,044	\$ -	\$50,000	\$51,500	\$37,544	\$25,000	\$50,000	\$50,000
Totals	\$7,774,814	\$88,530	\$1,635,193	\$692,700	\$499,853	\$446,544	\$3,315,647	\$1,094,347

Notes: *as determined by municipal officials. **Represents the total of major and minor capital projects.

4.4 Preliminary Stormwater Utility Revenue Analysis

This section discusses the preliminary analysis for a stormwater utility fee that were considered to illustrate the concept of a stormwater utility and obtain Steering Committee and Stakeholder Group feedback. It is important to note that this analysis is very preliminary and detailed data for land use by parcel was not readily available in most communities and the level of service for the future stormwater program is not finalized. However, this information provides a sense of what a stormwater utility might look like for participating communities in the Upper Narragansett Bay region based on what we know now.

4.4.1 User Fee Methodology – Basic Structure & ERU

Background

A stormwater utility recognizes a property's demand on the stormwater system for discharging their runoff. The stormwater system is a public system that carries runoff away from both public and private properties. The framework that determines how much each property pays is called the "rate structure". The funding mechanism developed for a particular utility is composed of three modules:

- User fee methodology;
- Modification factors such as stormwater fee credits, which can be applied to a user fee to enhance equity, reduce costs, and meet other objectives; and
- Secondary funding methods that can be adopted in concert with the service charges.

User fee structures differ among utilities and the differences sometimes reflect program goals or priorities such as the desire to encourage green designs or preserve open space, the influence of other policy objectives such as growth management or economic development, technical constraints, or the availability of resources like GIS or other databases.

A key attribute of utility service fee funding is that the governing body of a utility's jurisdiction has broad authority to design its rate methodology to fit local circumstances and practices and achieve an allocation of the cost of services and facilities that it desires, while staying within legal boundaries. The goal of a utility's funding decisions is to design a user fee structure that reflects the character and desires of the community and that meets five tests:

1. It is equitable and reasonable;
2. It is not discriminatory or confiscatory;
3. It has costs that are substantially related to provision of facilities and services;
4. It has a rate that is related to demand of the stormwater systems and services for each individual property (rational nexus); and
5. It reflects the authority inherent in state law.

User Fee Methodology

The user fee methodology defines the basis for the fee that users will be paying. The three main impacts on surface water of urban development are increases in peak flow, volume of discharge, and amount of pollution. All impacts can fit into these three basic categories. Accommodating the runoff that occurs when pervious area that typically infiltrates rainwater, is converted to impervious area requires the City to invest in the public drainage system. Therefore, it is appropriate to use a measurement of impervious area or surrogate of impervious area in rate methodologies. Stormwater billing is often based on a unit of imperviousness that reflects a typical residence – called the Equivalent Residential Unit (ERU). The ERU value is most often expressed in terms of square footage of impervious area (IA), as impervious area provides a fair approximation of stormwater contribution from a parcel relative to other parcels in the system.

Estimate of ERUs

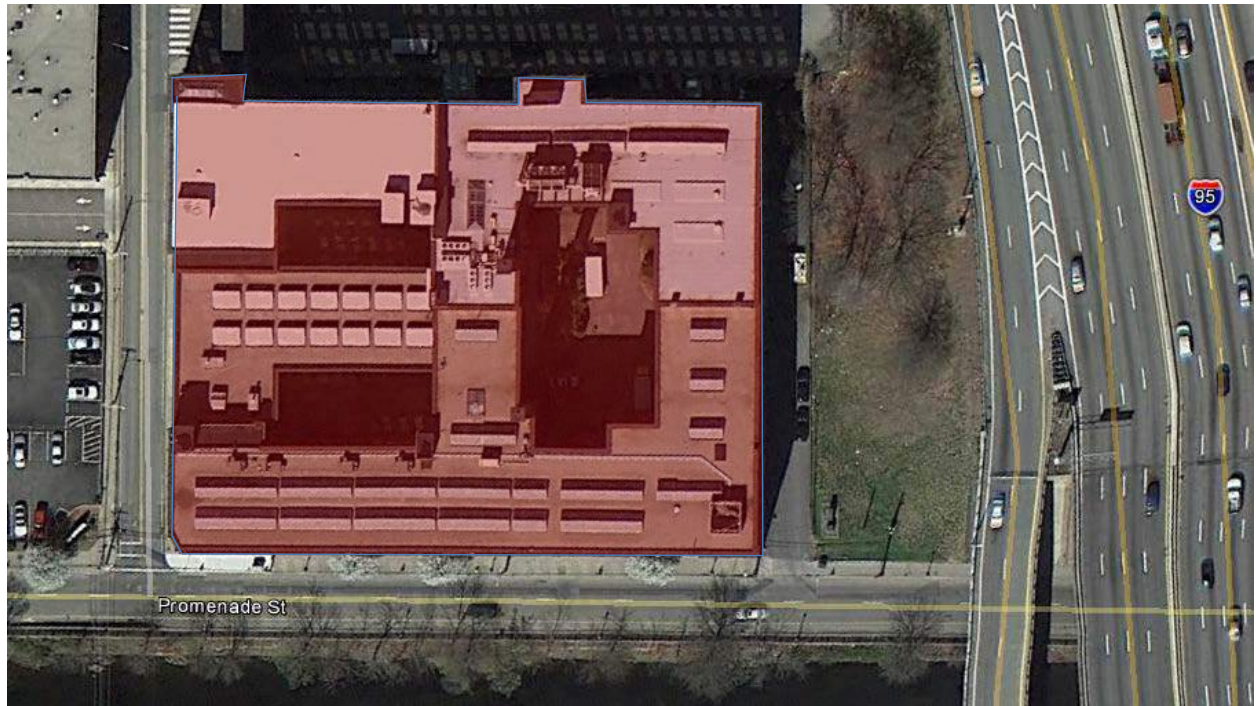
Land use data by parcel were not available for each of the participating communities to calculate a median ERU by community. Therefore, the Project Team calculated the total number of billed impervious acres, billable parcels and total number of ERUs by community assuming an ERU size of 2,500 sqft. Non-billable parcels were assumed to be roads, state properties and parcels with <400 sqft of impervious area. These parcels and their associated impervious area from the 2012 RI GIS state-wide impervious GIS data layer were excluded from the analysis. The results are presented in **Table 4.9**.

Table 4.9 Total Equivalent Residential Units (ERUs)

Municipality	Parcels	Total Acres	IA Acres	Billed IA Acres	ERUs
Central Falls	2,854	825	548	344	5,991
Cranston	32,130	18,505	6,067	3,805	66,305
East Providence	15,544	8,953	3,292	2,064	35,971
North Providence	11,124	3,708	1,667	1,064	18,222
Pawtucket	19,305	5,670	3,481	2,184	38,046
Providence	40,840	12,037	7,672	4,812	83,839
Warwick	38,086	22,971	7,931	4,974	86,672
Totals	159,883	72,669	30,658	19,229	335,048

Figure 4.1 shows an example of the impervious coverage on a non-residential parcel in Providence that has approximately 67,200 square feet of impervious area. Using an ERU size of 2,500 square feet results in this parcel containing 27 ERUs (rounded) and would be billed based on the stormwater program cost/ERU.

Figure 4.1 Sample Non-Residential Parcel ERU Calculation



4.4.2 Preliminary Rate Analysis

The stormwater program drives the utility rate resulting in a cost/ERU that is derived based on total revenue requirements and total ERUs, assuming a user fee approach. Based on the total number of ERUs across the study area, it is estimated that a fee of \$1.00/ERU/Month could support a stormwater program cost of approximately \$4M, as outlined in **Table 4.10** below.

Table 4.10 Potential Revenue at \$1.00/ERU/Month

Municipality	Parcels	ERUs	Annual Revenue \$1/ERU/Month Fee
Central Falls	2,854	5,991	\$71,892
Cranston	32,130	66,305	\$795,660
East Providence	15,544	35,971	\$431,652
North Providence	11,124	18,222	\$218,664
Pawtucket	19,305	38,046	\$456,552
Providence	40,840	83,839	\$1,006,068
Warwick	38,086	86,672	\$1,040,064
Totals	159,883	335,046	\$4,020,552

As discussed in Section 4.3, the project team developed an “initial estimate” of future program costs based on each individual municipality’s existing program and the limited data that was available. In addition, the team also estimated future program costs for each municipality using a standard basis of \$175/developed acre per year.

The estimated fee per ERU per month was derived using both the initial estimated of future program costs, and the estimate of future program costs based on a standard for a moderate program level of service (\$175/per developed acre). This information is summarized in **Table 4.11** below and indicates that initial rates would be less than \$4/ERU/month in all communities and between \$2 and \$3/ERU/month on average across the study area. However, it is important to note that further analysis and policy discussions are needed to define the service area for the stormwater utility in Central Falls, Pawtucket and Providence and whether they include the CSS areas as part of the stormwater utility (e.g., green infrastructure & coordination with NBC’s program). The current analysis uses the total number of ERUs across the study area, but the program costs associated with the CSS areas have not been defined.

Table 4.11 Rates Based on Future Stormwater Program Costs

Municipality	ERUs	Current Budget	Future Program Initial Estimate	Fee \$/ERU/Mo	Future Program \$175/dev. acre/year	Fee \$/ERU/Mo
Central Falls	5,991	\$53,168	\$88,530	\$1.23	\$134,400	\$1.87
Cranston	66,305	\$1,354,073	\$1,635,193	\$2.06	\$2,562,560	\$3.22
East Providence	35,971	\$275,400	\$692,700	\$1.60	\$1,500,800	\$3.48
North Providence	18,222	\$117,847	\$499,853	\$2.29	\$649,600	\$2.97
Pawtucket	38,046	\$135,743	\$446,544	\$0.98	\$974,400	\$2.13
Providence	83,839	\$1,346,343	\$3,315,647	\$3.30	\$2,072,000	\$2.06
Warwick	86,672	\$541,313	\$1,094,347	\$1.05	\$3,180,800	\$3.06
Totals	335,046	\$3,823,887	\$7,774,814	\$1.79	\$11,074,560	\$2.68
				(avg.)		(avg.)

The Steering Committee and Stakeholder Group were polled to gauge the following:

- **Steering Committee Willingness to Pay** – the monthly fee per billing unit (ERU or single-family residence) that each member would be willing to pay based on the current understanding of stormwater program needs.
- **General Population Willingness to Pay** – the amount that members felt the general population would be willing to pay.

The results of the evaluation are provided in **Table 4.12**.

Table 4.12 Evaluation of “Willingness to Pay”

Willingness to Pay (\$/Mo/ERU)	Steering Committee Voting		Stakeholder Group Voting	
	SC Members	General Population	Stakeholder Members	General Population
\$0	0	2	0	0
\$1	0	1	0	0
\$2	0	1	0	0
\$3	0	1	0	1
\$4	3	4	0	9
\$5	1	2	3	2
\$6	0	1	1	-
\$7	1	-	1	-
\$8	2	-	0	-
\$9	0	-	0	-
\$10	2	-	5	-
\$15	0	-	3	-
\$20	1	-	0	-

The voting generally indicates that some of the Steering Committee and Stakeholder Group members are willing to pay a much higher fee than the perceived willingness of the general population. Most felt that \$4/month/ERU was the most that the general population would be willing to pay for stormwater, assuming a basic level of understanding for an enhanced stormwater program.

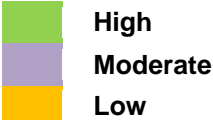
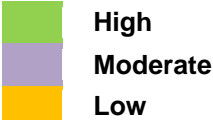
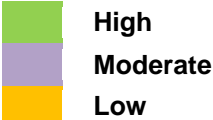
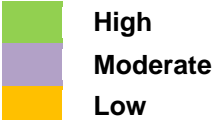
Whether a charge of \$4/ERU/mo would actually cover the costs of a regional stormwater program is largely dependent on compliance drivers and ultimate costs for such compliance. If extensive retrofitting is required for the reduction of pollutants then, based on experience elsewhere, costs could be three times this number. However, early indications are that this number would provide significant revenue to begin to address both existing infrastructure needs and support other compliance costs. It should be noted that significant stormwater related costs will be borne by NBC as part of the sewer fee as well.

Benefits of Regionalization

The qualitative benefits of regionalization were considered in Section 4.1 (refer to Table 4.5) and it is difficult to quantify the economic benefits during an initial feasibility study. However, the information provided in Table 4.5 and an understanding of the participating community characteristics can be used to further consider the economic benefits. Due to the extent of CSS systems in Central Falls and Pawtucket, an individual stormwater utility may not make sense, but participating in a regional approach would provide benefits with less of a management burden. The remaining participating communities may be able to gain additional economies of scale for specialized services and other program costs, as outlined in **Table 4.13** below.

It is important to note that the NBC and RIDOT manage significant infrastructure within the UNB study area with CSS and MS4 interconnections in some or all of the communities. The stormwater related needs and costs for the NBC and RIDOT have not been incorporated into the current regional analysis, but warrant further consideration during the Phase II Study. An equitable regional approach involving the NBC and RIDOT can provide additional benefits and economies of scale. Refer to the example of coordinated maintenance discussed in Section 1.3 for the Woonasquatucket River Watershed.

Table 4.13 Summary of Regional Costs & Economy of Scale

Major Cost Center	Current Annual Cost	Future Cost (5-yr avg.)	Relative Economy of Scale:
Administration	\$138,381	\$173,498	
<i>Indirect Cost Allocation (20%)</i>	\$637,315	\$1,295,469	
Operations and Maintenance	\$1,951,409	\$3,708,821	
Engineering and Master Planning	\$325,322	\$719,408	
<i>BMP Design</i>	\$ -	\$300,000	
Regulation/Enforcement	\$72,371	\$121,140	
Capital Improvement Projects	\$664,934	\$1,190,434	
<i>Major Capital Projects</i>	\$337,434	\$837,434	
<i>Minor Capital Projects</i>	\$327,500	\$353,000	
Water Quality Monitoring	\$34,156	\$264,044	
Total	\$3,823,887	\$ 7,774,814	

4.4.3 Credits

Under the Rhode Island enabling legislation, municipalities are required to offer credits as a part of all stormwater utilities. Offering credits typically has little impact on revenue (less than 5%) and often provides incentive for property owners to engage in activities such as removing unnecessary impervious cover or constructing stormwater BMPs onsite. The scope of work for this study did not include an evaluation of credits, but background information related to credits is provided below for future consideration.

Credits...

- Are a legal “requirement”
- Normally little revenue impact (<5%)
- Offers a carrot
- Credits are earned, not given, and not an “exemption” or “incentive”
- Ongoing recognition of ongoing private investment for a public good

Credit systems are becoming increasingly important in stormwater utilities because they create incentives for property owners to reduce the amount and/or improve the quality of stormwater generated on their property. It is not enough to simply provide funding for the stormwater

program, property owners need to help manage stormwater on-site, at the point it is generated. For example, roof runoff can be directed to a dry well on the property, and depending on the size, parking lot runoff can also be “disconnected” by draining to a lawn area, rain garden or other on-site infiltration or treatment system. Improvements made by property owners reduce the volume of runoff that must be managed by the town and thus reduce the town’s overall stormwater program costs.

There are two types of credits:

1. Impact Reduction – Measure of impervious area (IA) may not reflect a property’s true impact to the system, if the runoff from the IA is managed on-site
 - Often tied to managing stormwater on-site and thus reducing impact to the larger system or meeting design criteria.
2. Cost Reduction – Reduces the City’s or regional entity’s costs through private efforts (less common)
 - Take on a public responsibility such as education or maintenance (i.e. education on water quality, maintenance of larger areas or RIPDES permit compliance).

The following key policy questions must be considered:

- Policy Question #1: What private action and investment should qualify for a credit?
- Policy Question #2: How much of the stormwater program should be available for crediting and how generous should the credit be?

There are a few additional things worth noting about credits. Credit systems can be complex to administer and may not be large enough to cause any real change. The majority of property owners will likely decide that their bill is not large enough to necessitate behaviors that will qualify for credits. Credits are also not aligned with development as the owner of the property, not the developer, receives the credit. This reduces the incentive for developers to take credits into consideration when designing and constructing new developments. Credits are also a “zero sum game.” The more credits the City or regional entity gives away, the higher everyone else’s bill can become, especially in the short to intermediate term.

Reasons to cap credits:

- Fixed costs – 5%±
 - this cost will not decrease
- Irreducible and unrelated program costs – 15%±
 - this cost is not tied to impervious area
- Roads – everybody should pay – 35%±
 - this cost is allocated to everyone now
- Limits on treatment effectiveness
 - can’t eliminate all impacts of development

If the UNB region moves forward with a regional stormwater utility, policy decisions addressing a credit system will need to be analyzed from both a policy and finance perspective.

4.5 Billing & Data Analysis

This preliminary Phase I Study did not include a significant effort to review data and billing information related to a stormwater utility and a detailed effort needs to be completed as part of the planning project under Phase II. The purpose of this subsection is to provide an introduction to billing, considerations for a regional stormwater utility and feedback obtained during the Phase I Study meetings. When most people think of municipal bills to support revenue or services the most common are tax, water and sewer bills. The tax bills are associated with a specific billing or physical address and are typically billed semi-annually or annually. Water and sewer bills are associated with a water meter and are typically billed monthly or quarterly.

There are generally four options for billing a stormwater user fee: Tax bill; public utility bill (water or wastewater - most common); private utility bill (e.g., electric); and a new stand-alone bill. In Rhode Island, water and sewer billing account files are typically based on the Tax Assessor's database and the relationship of parcel ID to billing account is clear, including parcels with multiple accounts and multiple parcels with the same account. Water and sewer bills are often delivered with taxes, as would likely be the case with stormwater.

Depending on the billing system option that is selected to bill stormwater user fees, an appropriate stormwater "master account file" (MAF) needs to be developed.

NBC Feedback on Billing

Billing for a regional stormwater utility by the NBC was discussed during Steering Committee Meeting #3. In general, the NBC Board of Commissioners does not want to do billing for another entity in the case of a new "regional entity" that would be managing the stormwater program. The following feedback and information was provided during the meeting and subsequent correspondence with NBC staff:

- The NBC doesn't want to be perceived as trying to impose new fees on the community, and therefore, is not in favor of integrating stormwater user fee billing into its existing sewer bills.
- Although there may be efficiencies through integration of administrative functions and customer service, the NBC service area does not include all of the municipalities involved in this feasibility study.
- NBC does not want to collect a fee for a service that they will not be responsible for providing. The stormwater user fee would be a "pass through" with NBC having no way of accounting for the intended subsequent expenditures.
- NBC's current position is that they don't want to take on billing for a regional stormwater entity. The two biggest hurdles to change that position are the NBC Board of Commissioners and the Public Utilities Commission (PUC). There are other entities that serve more people that might be willing to do billing.
- NBC is regulated by the PUC so everything that appears on their bill has to be approved by the PUC.

Data Evaluation and Future Needs

Based on the data reviewed during the initial feasibility study, the following data needs were identified to support an in-depth planning study to develop a regional stormwater utility:

- Impervious Data: the existing state-wide impervious cover GIS data layer provides good capture of impervious surfaces and may only need minor updating as new imagery is available. A basic review and update of major non-single family residential (NSFR) features is recommended to capture any significant data gaps in coverage. Prior to implementation-phase rate modeling or development of a billing master account file (MAF), the Project Team recommends that the impervious for all properties be reviewed/updated on a finer scale to improve accuracy at a capture scale that would support measurements to the nearest 500 sq ft.
- Parcel/Imagery Alignment: the parcel data alignment in some communities such as North Providence is very poor and requires updates to the parcel GIS data layer. Other communities have less severe alignment issues, but may require some per-property spatial alignment to appropriately assign impervious area polygons to parcels. The Project Team understands that the Town of North Providence is in the process of updating its parcel GIS data layer.
- Imagery: the Project Team reviewed aerial imagery provided online by ESRI and Bing and it is anticipated that this image source is suitable for any future stormwater utility effort, unless another source is provided. That said, the available imagery is recent and of high-quality but has differing resolutions for some communities and may be from slightly different timeframes. Impervious capture should be planned based on lowest resolution available.
- Parcel Data: existing parcel data needs to provide enough information to cleanly separate detached-single-family (SFR) from NSFR properties.
- Parcel/Utility Account Association: using updated parcel GIS data layers, matching between parcels and existing water/sewer accounts will be needed to identify any stormwater-only properties and to develop the correct account/parcel associations in the MAF.
- Rate Model and Credit Support: an analysis/query/report of properties and impervious information will be necessary as rate structure, billing units, credits, and rate model are evaluated.
- MAF Development: one of the final steps in utility implementation includes the development of the MAF for billing. This effort incorporates all rate factors, parcel classification, final parcel/account association, fee calculation, fee-testing and verification, test-file integration with billing system, technical implementation support, and basic documentation. The development of the MAF will depend largely on how the new “regional entity” operates and carries out administrative functions.

5.0 Recommendations & Next Steps

5.1 Summary of Recommendations

Based on the results of the initial feasibility study, the following conclusions are drawn:

1. Maintaining status quo is not an option: flooding, water quality problems, and deteriorating infrastructure require action;
2. The costs for the future stormwater management programs for each municipality will be significantly higher than current expenditures;
3. Compliance with MS4 Permits (including TMDL requirements) will require a combination of non-structural and structural controls implemented over time and through a comprehensive strategy;
4. The current level of funding from general fund is inadequate to meet program needs; and
5. The likelihood that the general fund in each community can fully fund the increasing program needs and costs is low.

The following recommendations were developed through meetings with the Steering Committee and Stakeholder Group:

1. **Continue to explore a regional approach with a stormwater user fee:** the majority of the Steering Committee and Stakeholder Group members were neutral or felt that a regional approach for stormwater management with funding through a user fee versus tax revenue was the best approach among the available options.
2. **Pursue additional funding for the implementation of next steps:** the RI Bays, Rivers and Watersheds Coordination Team has awarded \$150,000 towards the Phase II Study. A grant application was submitted on January 31, 2014 for the Hurricane Sandy Coastal Resiliency Competitive Grants Program with the National Fish and Wildlife Foundation (NFWF) for additional funds to complete the Phase II Study. The NFWF anticipates awarding grants in June 2014.
3. **Engage and update stakeholders in each of the participating communities:** schedule meetings with key municipal staff and other stakeholders to provide an update on the results of the project and develop support for next steps.
4. **Conduct public presentations for elected officials on the Phase I Study:** this is already planned as a continuation of the study to be completed by the Project Team. So far, public presentations were completed at City Council meetings in Pawtucket on May 21, 2014 and Cranston on June 2, 2014.
5. **Engage the current stakeholder group in additional public presentations:** work with interested members to make presentations about the regional approach to other community leaders, including: trade associations, chambers of commerce, and other property owner groups.

5.2 Next Steps & Roadmap

Concurrent with the completion of the initial feasibility study, the City of Providence acting on behalf of the regional study participants, prepared an application for the Hurricane Sandy Coastal Resiliency Competitive Grants Program to continue what has become defined as the Phase II Upper Narragansett Bay Regional Stormwater Management (UNBRSM) Initiative. The application was submitted on January 31, 2014 and discussed the progress to date for the Phase I study with a proposed scope of work and road map for the Phase II Planning Project and a future Phase III for final implementation. The grant application included the following six communities from the Phase I Study:

- Central Falls
- Cranston
- East Providence
- Providence
- Pawtucket
- Warwick



The overall goal of the UNBRSM Initiative is to develop and implement a regional solution to address the financial, operational, environmental, and management issues and needs of communities in the Upper Narragansett Bay watershed. The Phase II Planning Project will explore the viability of a regional stormwater management and funding approach through a regional stormwater utility, which will address infrastructure improvements, water quality, habitat protection, and flooding issues. The UNBRSM initiative will provide a more integrated program across the six communities with model approaches for implementation of activities to meet each community's needs. Final adoption of a regional stormwater utility or an alternative funding approach will be completed under Phase III – Implementation.

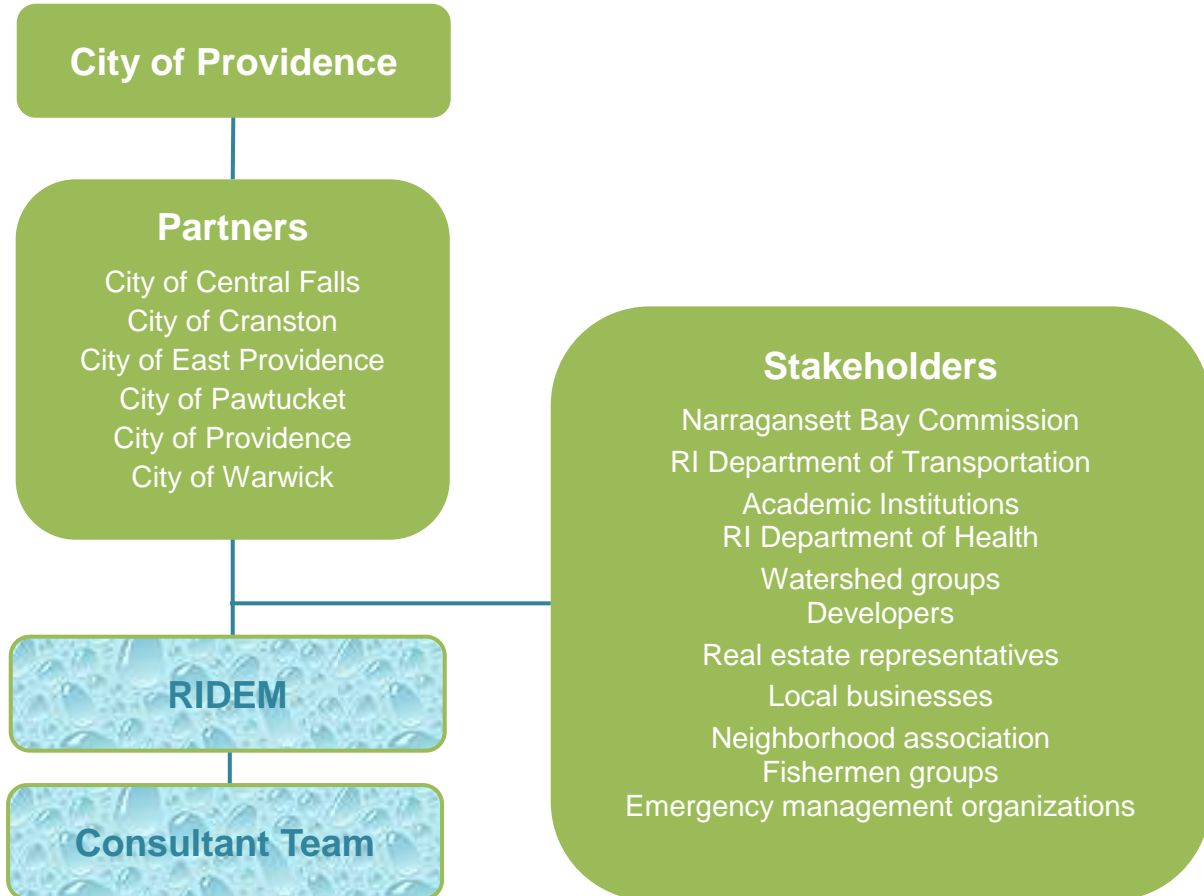
The five key goals of the Phase II Planning Project are as follows:

1. Evaluate priority areas and establish a process for consistent asset mapping, asset inventory, and condition assessment related to coastal resiliency and stormwater management planning;
2. Assess current and future stormwater management program operational and capital needs and costs;
3. Develop a strategic organizational structure and governance plan for sustainable UNBRSM and coastal resiliency;
4. Complete all aspects of tactical planning to support a regional stormwater utility under Phase III – Implementation; and
5. Enhance public awareness of the UNBRSM initiative and regional issues through planned public outreach.

As depicted on the organization chart in **Figure 5.1**, the City of Providence with support and assistance from RIDEM, a consultant team, and interns, will continue to lead a Project Team of partnering municipalities and stakeholders for the detailed planning phase of the Upper Narragansett Bay Regional Stormwater Management Initiative. The Project Team will be

supported by an advisory stakeholder group that has been actively involved in the Phase I Feasibility Study.

Figure 5.1 Phase II Project Team Organization



The project manager for Phase II is likely to be Ms. Sheila Dormody, City of Providence’s Director of the Office of Sustainability. Ms. Dormody along with support from the Deputy Chief of RIDEM’s Office of Water Resources, Ms. Elizabeth Scott, has been spearheading efforts to improve the City and region’s resiliency efforts and was the project manager for the Phase I Feasibility Study for the regional stormwater utility.

UNBRSM Initiative (Phase II) Work Plan

Figure 5.2 presents the comprehensive work plan envisioned for the three-phased UNBRSM Initiative and the key activities associated with each of the three phases. This information was presented in Section 1.3 and Figure 1.3, but it is presented again herein to illustrate how Phase II fits into the overall approach. For effective planning and implementation, the key activities are grouped into the following five distinct tracks:

- **Stakeholders:** Involves all activities pertaining to engaging internal and external stakeholders, and activities associated with the broader public/rate payer education and outreach.
- **Program:** Involves both strategic and tactical activity components ranging from program planning and prioritization to in-depth asset inventory development and mapping.
- **Organization:** Involves defining all activities that relate to policy, legislation, inter-governmental agreement issues and organizational authority, staffing and structure.
- **Finance:** Involves financial planning including funding strategies and rate structure, and defining all aspects of accounting, budgeting, and financing processes.
- **Billing Systems / Management:** Involves activities that relate to defining parcel data management and billing systems, and developing draft manuals, regulations, and business processes.

Phase II includes twenty-eight (28) key activities that span these five tracks. While some activities build upon each other, many others will be performed concurrently.

Figure 5.2 Comprehensive Work Plan: UNBRSM Initiative

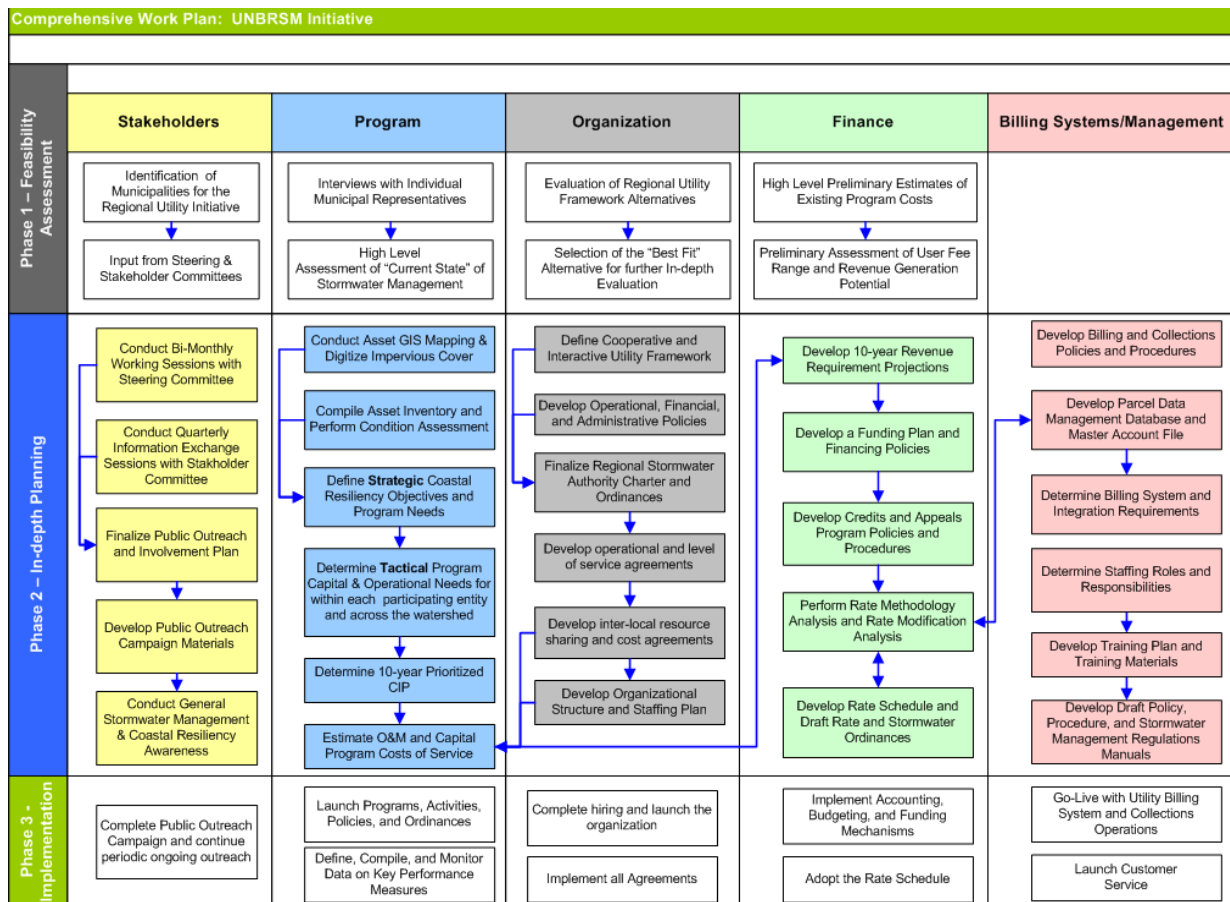


Table 5.1 provides a brief summary of the entities responsible, the anticipated outputs, and the proposed timeline for the Phase II Work Plan.

Table 5.1 Phase II Work Plan Logistics

#	Activity	Lead entity	Completion timeline	Key outputs
Stakeholders Track				
S1	Quarterly Steering Meetings	Consultant	September 2015	Presentations / Papers
S2	Quarterly Stakeholder Meetings	Consultant	September 2015	Presentations / Papers
S3	Public Outreach Plan	Consultant	March 2015	Outreach Plan
S4	Public Outreach Materials	Consultant	April 2015	Brochures / Media Info
S5	Awareness Campaign	Partners	August 2015	Six outreach events
Program Track				
P1	GIS Asset Mapping & Inventory	Interns	October 2014	GIS Asset Database
P2	Asset Condition & Impervious Cover Assessment	Consultant	December 2014	Parcel Database
P3	Coastal Resiliency Objectives, Needs & Priorities	Providence & Partners	December 2014	Strategic Objectives
P4	Storm Drain Infrastructure Vulnerability Assessment	Consultant	January 2015	Key Infrastructure Prioritization Scheme
P5	Capital & Operational Program Assessment	Consultant	January 2015	Tactical Needs Report
P6	10-year Prioritized CIP	Providence & Partners	February 2015	10-year CIP Project Schedule
P7	O&M and CIP Cost Estimates	Consultant	March 2015	Preliminary Costs
Organization Track				
O1	Co-operative and Interactive Regional Utility Framework	Consultant	March 2015	Regional Utility Organizational Plan
O2	Operational, Financial, Administrative Policy Development	Consultant	March 2015	
O3	Regional Utility Charter & Ordinances	Providence	April 2015	UNBRSM Draft Charter
O4	Service Level Agreements (SLAs)	Providence	May 2015	Draft SLAs
O5	Resource / Cost Sharing Agreements	Providence	June 2015	Draft MOUs
O6	Organizational Structure & Staffing	Consultant	March 2015	Regional Utility Organizational Plan

#	Activity	Lead entity	Completion timeline	Key outputs
Finance Track				
F1	10-year Revenue Requirement Projections	Consultant	May 2015	UNBRSM Financial Plan
F2	Financial Policies & Funding Plan	Consultant	April 2015	
F3	Credits/Appeals Program Policies & Procedures	Consultant	April 2015	Draft Credit Program Manual
F4	Rate Methodology & Structure Analysis	Consultant	May 2015	UNBRSM Financial Plan
F5	Draft Rate Schedule & Ordinances	Consultant & Providence	June 2015	Draft Rate Ordinances
Billing Systems/Management Track				
B1	Billing & Collections Policies / Procedures	Consultant	July 2015	Draft Billing Operations SOP
B2	Parcel Data Analysis Database	Consultant	March 2015	Master Account File
B3	Finalization of Billing System	Providence	July 2015	Billing System Plan
B4	Staffing Roles & Responsibilities	Providence	June 2015	Staffing and Training Plan
B5	Training Plan and Materials	Consultant	August 2015	Training Plan
B6	Draft Stormwater Management Regulations	Consultant	August 2015	Draft UNBRSM Regulations
Phase II – UNBRSM Planning Project Completion			September 2015	

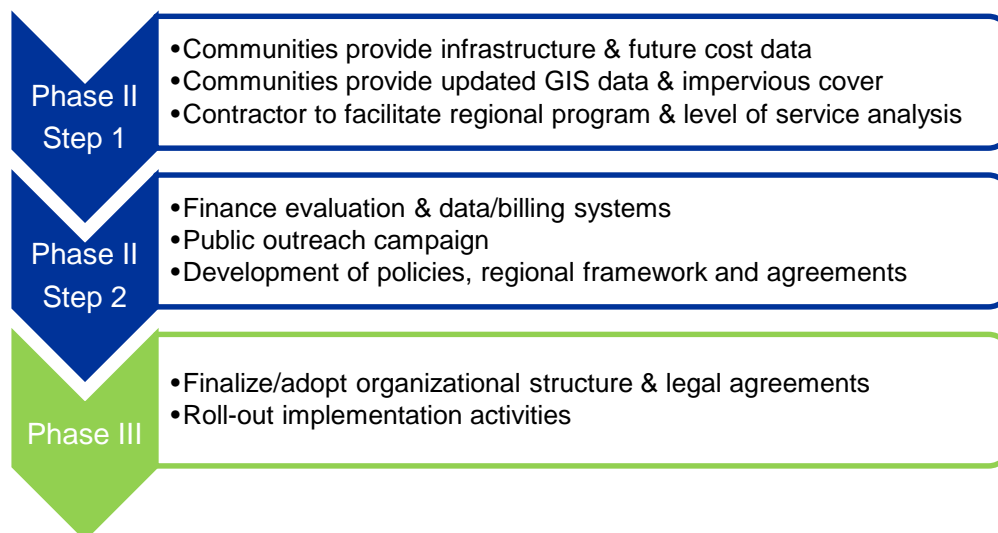
5.3 Budget Estimate for Next Steps – Phase II

A budget summary was developed for the Phase II Planning Project and submitted as part of the Hurricane Sandy Grant. The grant proposal requested \$499,685 that will supplement the existing \$150,000 available from the RI Bays, Rivers and Watersheds Coordination Team and match (in-kind services) from the RIDEM and participating communities. The full project cost is summarized in **Table 5.2** below and includes in-kind services (staff time, fully-burdened labor) for the 6 municipal partners and the RIDEM.

Table 5.2 Budget Summary for Phase II Planning Project & NFWF Grant Application

Phase	Description	Cost
1	Stakeholder Track	\$128,140
2	Program Track	\$315,623
3	Organization Track	\$70,560
4	Finance Track	\$86,479
5	Billing System/Management Track	\$86,682
6	Project Management / Project Meetings	\$65,701
7	Draft & Final Plans	\$39,920
8	Data Compilation & Analysis Contingency	\$10,000
9	Project Meetings/Field Work Travel (Trips)	\$18,000
Total		\$821,105
<i>In-Kind Match</i>		\$171,420
<i>Cash Match</i>		\$150,000
<i>Requested NFWF Grant</i>		\$499,685

In the event the NFWF grant is not successful, the Steering Committee discussed the options to continue the project with the current committed funds from the RI Bays, Rivers and Watersheds Coordination Team of \$150,000 while continuing to seek additional grant funds. This would require additional community support (staff time and/or financial contribution) to accelerate the project with funding contributions and/or provide infrastructure mapping and assessment and an evaluation of future program needs. Additionally, the schedule for implementing Phase II would need to be modified. A preliminary 2-step approach was developed for future consideration:



Appendix I

Impaired Waters in Participating Municipalities & TMDL Requirements

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

Central Falls

Blackstone River Metals TMDL – approved by US EPA 5/2/2013

SWMPP 6MM Modification - Construction/Post Construction

The City of Central Falls must evaluate the sufficiency of its six minimum measures to meet TMDL water quality objectives and at a minimum must revise local ordinances to ensure that: New land development projects employ stormwater controls to prevent any net increase in bacteria pollution to the Blackstone River Watershed. Redevelopment projects to employ stormwater controls to reduce bacteria and metals pollution to the study area watershed to the maximum extent feasible. These apply to MS4-owned facilities as well.

Cranston

Eutrophic Pond Phosphorus TMDL – Spectacle Pond – approved by US EPA 11/14/2007

SWMPP 6MM Modification - Public Education and Outreach

The City of Cranston must amend its SWMPP to focus public education and outreach in the watershed of Spectacle Pond that includes minimizing the adverse effects of lawn fertilizers and pesticides, proper disposal of pet waste, discouraging large waterfowl populations, and prohibiting illegal tie-ins to storm drains.

SWMPP 6MM Modification - Pollution Prevention/Good Housekeeping

The City of Cranston must amend its SWMPP to investigate the feasibility of increased street sweeping and/or stormwater system maintenance to address sediment loads to Spectacle Pond, especially in the Lake Street catchment. Street sweeping in priority areas within the watershed, identified in the TMDL document, must be conducted more frequently than the required twice-annual schedule.

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

The City of Cranston must amend its SWMPP to prioritize illicit discharge detection and elimination within catchments associated with the outfalls that were identified in the TMDL (Appendices A and B). Illicit discharge detection and elimination should begin with priority outfalls identified in Table 4.6 of the TMDL document. Also municipal sewer lines should be tested for significant leaks. Force mains are of particular concern since the effluent is under pressure, although there is also the potential for leaks in gravity-fed pipes.

SWMPP 6MM Modification - Construction/Post Construction Runoff Control

The revised SWMPP must address revisions to the local ordinances to ensure that: 1. New land development must employ stormwater controls to prevent any net increase in pollutants of

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

concern (phosphorus) for sites contributing to MS4s which discharge directly to Spectacle Pond. Redevelopment projects must employ stormwater controls to reduce phosphorus to the maximum extent feasible.

Structural BMPs

This TMDL has determined that structural BMPs are necessary to improve water quality in Spectacle Pond. RIDEM has identified outfalls as priorities for treatment (Table 4.6 of the TMDL document). SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls.

East Providence

Runnins River Bacteria TMDL – approved by US EPA 12/6/2002

City of East Providence Application for MS4 Phase II RIPDES Permit

MS4s that discharge to the Runnins River are operated by the City of East Providence. The SWMPP must include and schedule an action to map the County street storm drain system and inspect for illicit connections. SWMPPs submitted by East Providence and RIDOT should plan for the design and installation of structural BMPs on OJ Creek that reflect treatment levels needed to meet the reduction targets for the creek, focusing on methods to reduce peak stormwater flows reaching the creek through improved detention and infiltration.

Ten Mile River Bacteria, Phosphorus, and Metals TMDL – approved by US EPA April 17, 2014

Control of Illegal Dumping/Waste Disposal

The Cities of East Providence and Pawtucket should work with the Ten Mile River Watershed Council to identify and map problem disposal/dumping sites along the Ten Mile River. Once these sites are identified, municipalities should develop plans to clean up these areas. It is also recommended that the Cities enact an effective integrated catchment-wide litter management strategy including educational campaigns to bring about greater public awareness and response to litter and dumping problems, waste reduction to reduce the generation of urban waste, and an enforcement mechanism to insure compliance. Both municipalities should actively investigate complaints, and take enforcement actions, where appropriate.

Update SWMPP - TMDL Implementation Plan

East Providence is required to submit SWMPP amendments that address the TMDL Phase II provisions when it submits the SWMPP required by the re-issued MS4 General Permit. All TMDL provisions should be contained in a TMDL Implementation Plan (TMDL IP). The SWMPP

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

must be revised to describe the six minimum measures and other additional controls that have been or will be implemented to address the TMDL provisions. East Providence must provide measurable goals for the development and/or implementation of the six minimum measures and for additional structural and non-structural BMPs that will be necessary to address the stormwater control provisions identified in this TMDL.

SWMPP 6MM Modification - Public Education and Outreach

Stormwater Phase II public education programs should focus on both water quality and water quantity concerns within the Ten Mile River watershed. Public education material should target the particular audience being addressed. Audiences should include residential, commercial, industrial, and institutional property owners, land developers, and landscapers.

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

East Providence must amend its SWMPP to prioritize illicit discharge detection and elimination within catchments to those outfalls that discharge into Central Pond, Turner Reservoir, the lower portion of the Ten Mile River and Omega Pond.

SWMPP 6MM Modification - Construction/Post Construction

The TMDL IP must also address any revisions to local ordinances that are needed to ensure that: New land development projects employ stormwater controls to prevent any net increase in bacteria, metals, and phosphorus pollution to the study area watershed; Redevelopment projects to employ stormwater controls to reduce bacteria pollution to the study area watershed to the maximum extent feasible. These apply to MS4-owned facilities as well.

SWMPP 6MM Modification - Good Housekeeping/Pollution Prevention

Describe and implement practices to reduce bacteria, metals, and phosphorus in stormwater discharges from municipal facilities.

Structural BMP Requirements

The TMDL found that structural BMPs are needed. A BMP study to assess BMP feasibility must be completed that details the tasks necessary to design and construct BMPs that reduce the pollutant of concern and stormwater volumes to the maximum extent feasible. In the Ten Mile River, four outfalls should be prioritized. These outfalls are described in Table 63 of the TMDL and were identified/mapped by the city of East Providence and labeled as outfalls CP-6, CP-14, TR-5, OM-1, OM-2, and TM-7. East Providence should conduct a BMP feasibility study for the catchment areas of these outfalls and the revised SWMPP must establish a phased schedule for completing catchment area analyses, design, and construction of structural BMPs.

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

North Providence

Woonasquatucket River Bacteria and Metals TMDL – approved by US EPA 8/29/2007

SWMPP Modification - Public Education and Outreach

The Town of North Providence must amend its SWMPP and develop an aggressive town-wide educational program aimed at changing current behaviors to protect and preserve water quality in the Woonasquatucket River. Topics that must be included are pet and solid waste management, proper lawn care and good housekeeping practices, as well as discouraging littering and illegal debris disposal. Public education must also focus on the adverse effects of stormwater runoff. Signage should be installed at all parks and public greenway areas adjacent to the river where pets are commonly walked. The SWMPP should focus educational programs on commercial and industrial companies located within the floodplain and include information on proper waste management, stormwater runoff, and other good housekeeping practices.

SWMPP Modification - Pollution Prevention/Good Housekeeping

The Town of North Providence its SWMPP to include stronger litter management strategies in Greystone, Centerdale, Allendale, and Lymanville, such as increasing the number of trash cans in common areas, increasing the number of dog waste receptacles, targeted inspections by city officials to insure dumpsters are covered and regularly emptied, and increasing street sweeping and catch basin cleaning in the same areas to more than the once annual basis.

SWMPP Modification - Illicit Discharge Detection and Elimination

The Town of North Providence must amend its SWMPP to prioritize illicit discharge detection and elimination within the Woonasquatucket River. Areas adjacent to the river in Lymanville, Allendale, Centerdale, and Greystone should be prioritized.

SWMPP Modification - Post Construction Runoff Control

The revised SWMPP must address revisions to the local ordinances to ensure that: 1. New land development must employ stormwater controls to prevent any net increase in pollutants of concern and redevelopment projects must employ stormwater controls to reduce pollutants to the maximum extent feasible. POC = bacteria (for sites contributing to MS4s which discharge directly to segments 10C-10D in the Woonasquatucket River and for zinc, copper, and lead for segment 10D of the river. 2. Redevelopment projects must employ stormwater controls to reduce bacteria to the maximum extent feasible (for sites contributing to MS4s which discharge directly to segments 10C and 10D in the Woonasquatucket River) and zinc, copper, and lead to the maximum extent feasible (for sites contributing to MS4s which discharge directly to segments 10C and 10D of the river).

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Structural BMP Requirements

This TMDL has determined that structural BMPs are necessary to improve water quality in the Woonasquatucket River. DEM has identified the Woonasquatucket Avenue outfalls as a priority for treatment. Other priority areas must include outfalls and any other stormwater conveyances located in Greystone, Centerdale, Allendale, and Lymanville. The Town of North Providence must complete the identification, mapping, and determination of ownership of all outfalls to the Woonasquatucket River. Once identified, the Town must assess the pollutant load and prioritize outfalls for treatment. SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls.

Pawtucket

Ten Mile River Bacteria, Phosphorus, Metals TMDL – approved by US EPA April 17, 2014

SWMPP 6MM Modification - Public Education and Outreach

Stormwater Phase II public education programs should focus on both water quality and water quantity concerns within the Ten Mile River watershed. Public education material should target the particular audience being addressed. Measures that can reduce bacteria contamination include proper septic system maintenance, eliminating any wastewater connections to the storm drain network, proper disposal of pet waste, proper storage and disposal of garbage, and, not feeding waterfowl. Measures that can reduce the quantity of water that runs off during a wet weather event include decreasing effective impervious area and by providing on-site attenuation of runoff.

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

Pawtucket must amend its SWMPP to prioritize illicit discharge detection and elimination within catchments to those outfalls that discharge into the Ten Mile River and Central Pond-specifically in the Narragansett Industrial Park area. Pawtucket must review RIDEM-identified outfalls and report which outfalls contain MS4 stormwater.

SWMPP 6MM Modification - Construction/Post Construction

The TMDL IP must also address any revisions to local ordinances that are needed to ensure that: New land development projects employ stormwater controls to prevent any net increase in bacteria, metals, and total phosphorus pollution to the study area watershed; Redevelopment projects to employ stormwater controls to reduce bacteria pollution to the study area watershed to the maximum extent feasible.

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

SWMPP 6MM Modification - Good Housekeeping/Pollution Prevention

Describe and implement practices to reduce bacteria, metals, and phosphorus in stormwater discharges from municipal facilities.

Structural BMP Requirements

The TMDL found that structural BMPs are needed. A BMP study to assess BMP feasibility must be completed that details the tasks necessary to design and construct BMPs that reduce the pollutant of concern and stormwater volumes to the maximum extent feasible. In the Ten Mile River, four outfalls should be prioritized. These outfalls are described in Table 62 of the TMDL and were identified/mapped by the city of Pawtucket and labeled as outfalls 028, 039, 041, and 042. Pawtucket should conduct a BMP feasibility study for the catchment areas of these outfalls and the revised SWMPP must establish a phased schedule for completing catchment area analyses, design, and construction of structural BMPs. See TMDL and RIPDES General Permit for more details.

Blackstone River Metals TMDL – approved by US EPA 5/2/2013

SWMPP 6MM Modification - Construction/Post Construction

The City of Pawtucket must evaluate the sufficiency of its six minimum measures to meet TMDL water quality objectives and at a minimum must revise local ordinances to ensure that: New land development projects employ stormwater controls to prevent any net increase in bacteria pollution to the Blackstone River Watershed. Redevelopment projects to employ stormwater controls to reduce bacteria and metals pollution to the study area watershed to the maximum extent feasible. These apply to MS4-owned facilities as well.

Providence

Woonasquatucket River Bacteria and Metals TMDL – approved by US EPA 8/29/2007

SWMPP 6MM Modification - Public Education and Outreach

The City of Providence must amend its SWMPP to focus public education and outreach in areas of Olneyville and Smith Hill, and Dyerville that includes proper pet and residential waste management, proper lawn maintenance and good housekeeping practices, and discouraging littering.

SWMPP 6MM Modification - Pollution Prevention/Good Housekeeping

The City of Providence must amend its SWMPP to include stronger litter management strategies, particularly in Olneyville, Smith Hill, and Dyerville, such as increasing the number of trash cans in common areas, using youth volunteers to pick up trash, increasing the number of dog waste receptacles, targeted inspections by city officials to insure dumpsters are covered

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

and regularly emptied, and increasing street sweeping in same three areas to more than once annual basis.

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

The City of Providence must amend its SWMPP to prioritize illicit discharge detection and elimination within the Olneyville area as well as Kinsley and Promenade Streets where significant amounts of industrial, commercial, and high-density residential areas exist.

SWMPP 6MM Modification - Post Construction Runoff Control

The revised SWMPP must address revisions to the local ordinances to ensure that: 1. New land development must employ stormwater controls to prevent any net increase in pollutants of concern [bacteria (for sites contributing to MS4s which discharge directly to segments 10C-10D in the Woonasquatucket River and for zinc, copper, and lead for segment 10D of the river. 2. Redevelopment projects must employ stormwater controls to reduce bacteria to the maximum extent feasible (for sites contributing to MS4s which discharge directly to segments 10C and 10D in the Woonasquatucket River) and zinc, copper, and lead to the maximum extent feasible (for sites contributing to MS4s which discharge directly to segments 10C and 10D of the river.

Structural BMP Requirements

This TMDL has determined that structural BMPs are necessary to improve water quality in the Woonasquatucket River. DEM has identified Mancini Drive outfall and those outfalls or other stormwater conveyances located in Dyerville, Olneyville, and Smith Hill as priorities for treatment. The City of Providence must complete the identification, mapping, and determination of ownership of all outfalls to the Woonasquatucket River. Once identified, the City must assess the pollutant load and prioritize outfalls for treatment. SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls.

Mashapaug Pond Phosphorus TMDL – approved by US EPA 11/14/2007

Establish a Vegetated Buffer Along the Shoreline of Mashapaug Pond

RIDEM recommends that private property owners and the City of Providence establish a vegetated buffer along the shoreline of Mashapaug Pond.

SWMPP 6MM Modification - Public Education and Outreach

The City of Providence must amend its SWMPP to focus public education and outreach in the watershed of Mashapaug Pond that includes minimizing the adverse effects of lawn fertilizers and pesticides, proper disposal of pet waste, discouraging large waterfowl populations, and prohibiting illegal tie-ins to storm drains.

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

SWMPP 6MM Modification - Pollution Prevention/Good Housekeeping

The City of Providence must amend its SWMPP to investigate the feasibility of increased street sweeping and/or stormwater system maintenance to address sediment loads to Mashapaug Pond. For those outfalls having evidence of sediment deposition, Phase II plans must document that twice-annual street sweeping is sufficient to prevent further sediment accumulation and certify that there are no active eroding areas contributing to the sediment buildup.

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

The City of Providence must amend its SWMPP to prioritize illicit discharge detection and elimination within catchments associated with the outfalls that were identified in the TMDL. Illicit discharge detection and elimination should begin with priority outfalls identified in Section 6.4. Also municipal sewer lines should be tested for significant leaks.

SWMPP 6MM Modification - Construction/Post Construction Runoff Control

The revised SWMPP must address revisions to the local ordinances to ensure that: 1. New land development must employ stormwater controls to prevent any net increase in pollutants of concern (phosphorus) for sites contributing to MS4s which discharge directly to Mashapaug Pond. Redevelopment projects must employ stormwater controls to reduce phosphorus to the maximum extent feasible.

Structural BMP Requirements

This TMDL has determined that structural BMPs are necessary to improve water quality in the Mashapaug Pond. The storm drain system is poorly resolved. The City of Providence must complete the identification, mapping, and determination of ownership of all outfalls to Mashapaug Pond. Once identified, the City must assess the pollutant load and prioritize outfalls for treatment. SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls.

Eutrophic Ponds TMDL – Roger Williams Park Ponds – US EPA approved 11/14/2007

SWMPP 6MM Modification - Public Education and Outreach

The City of Providence must amend its SWMPP to focus public education and outreach in the watershed of Roger Williams Park Ponds that includes minimizing the adverse effects of lawn fertilizers and pesticides, proper disposal of pet waste, discouraging large waterfowl populations, and prohibiting illegal tie-ins to storm drains.

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SWMPP 6MM Modification - Pollution Prevention/Good Housekeeping

The City of Providence must amend its SWMPP to investigate the feasibility of increased street sweeping and/or stormwater system maintenance to address sediments loads to Roger Williams Park Ponds. Street sweeping in priority areas within the watershed, identified in the TMDL document, must be conducted more frequently than the required twice-annual schedule.

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

The City of Providence must amend its SWMPP to prioritize illicit discharge detection and elimination within catchments associated with the outfalls that were identified in the TMDL (Appendices A and B). Illicit discharge detection and elimination should begin with priority outfalls identified in Table 4.4. Also municipal sewer lines should be tested for significant leaks. Force mains are of particular concern since the effluent is under pressure, although there is also the potential for leaks in gravity-fed pipes.

SWMPP 6MM Modification - Construction/Post Construction Runoff Control

The revised SWMPP must address revisions to the local ordinances to ensure that: 1. New land development must employ stormwater controls to prevent any net increase in pollutants of concern (phosphorus) for sites contributing to MS4s which discharge directly to Roger Williams Park Ponds. Redevelopment projects must employ stormwater controls to reduce phosphorus to the maximum extent feasible.

Structural BMPs

This TMDL has determined that structural BMPs are necessary to improve water quality in the Roger Williams Park Ponds. RIDEM has identified outfalls as priorities for treatment (Table 4.4 of the TMDL document). The City of Providence must complete the identification, mapping, and determination of ownership of all outfalls to RWP Ponds. Once identified, the City must assess the pollutant load and prioritize outfalls for treatment. SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls.

Warwick

Greenwich Bay Waters Bacteria TMDL – approved by US EPA 3/9/2006

SWMPP 6MM Modification - Education Programs

The public education program should focus on both water quality and water quantity concerns within the watershed. Public education material should target the particular audience being addressed. Educational programs should emphasize that not cleaning up after pets and feeding waterfowl, such as gulls and geese, contributes to beach and shellfish bed closures.

Appendix I – UPPER NARRAGANSETT BAY MUNICIPALITIES TMDL REQUIREMENTS

SWMPP 6MM Modification - Illicit Discharge Detection

After sewer extension projects are completed, sewers will be available to most of the Greenwich Bay watershed. Communities may want to target illicit discharge detection and dry weather flow sampling in areas not slated for sewers.

SWMPP 6MM Modification - Construction/Post Construction

Storm water volume reduction requirements for development and redevelopment of commercial and industrial properties should be considered in the development of ordinances to comply with the construction and post construction minimum measures

Structural BMPs

This TMDL has determined that structural BMPs are necessary to improve water quality in Greenwich Bay. Priority should be given to activities in Brush Neck Cove and Apponaug Cove. Apponaug Cove contributes to the high bacteria concentrations found in adjacent areas of Greenwich Bay proper, and required reductions are among the highest for all of Greenwich Bay. Outfalls to Apponaug Cove and its tributaries have neither been identified nor prioritized for BMP construction. All storm water sources discharging to Brush Neck Cove and its two tributaries, Southern Creek and Tuscatucket Brook have been identified and mapped. Table 5.1 of the TMDL document lists priority locations identified by SRICD and direct storm water discharges identified by URI-CVE as large bacteria loads to Greenwich Bay. While outfalls discharging directly to Apponaug Cove were identified by URI-CVE, outfalls along Hardig Brook, Mill Brook, Gorton Pond Tributary, and Greenwood Creek have not been identified. The City of Warwick must complete the identification, mapping, and determination of ownership of all outfalls to Greenwich Bay. Once identified, the City must assess the pollutant load and prioritize outfalls for treatment. SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls. The SWMPP must also set a schedule for other areas not identified as priorities, areas that drain to Warwick Cove, Greenwich Cove, Buttonwoods Cove, and the Northern Shoreline, which includes Bakers Creek.

Eutrophic Ponds Phosphorus TMDL – Gorton, Sand, and Warwick Ponds – approved by US EPA 11/14/2007

SWMPP 6MM Modification - Public Education and Outreach

The City of Warwick must amend its SWMPP to focus public education and outreach in the watersheds of Gorton, Sand, and Warwick Ponds that includes minimizing the adverse effects of lawn fertilizers and pesticides, proper disposal of pet waste, discouraging large waterfowl populations, and prohibiting illegal tie-ins to storm drains.

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SWMPP 6MM Modification - Pollution Prevention/Good Housekeeping

The City of Warwick must amend its SWMPP to investigate the feasibility of increased street sweeping and/or stormwater system maintenance to address sediments loads to Gorton, Sand, and Warwick Ponds. Street sweeping in priority areas within the watershed, identified in the TMDL document, must be conducted more frequently than the required twice-annual schedule.

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

The City of Warwick must amend its SWMPP to prioritize illicit discharge detection and elimination within catchments associated with the outfalls that were identified in the TMDL (Appendices A and B). Illicit discharge detection and elimination should begin with priority outfalls identified in Tables 4.3, 4.5, and 4.8. The Gorton Pond watershed is mostly sewered, but some areas are still on individual septic systems. There also may be individual residences in the Gorton, Sand and Warwick Pond watersheds that have not tied into existing sewage systems even though the neighborhood is sewered.

SWMPP 6MM Modification - Construction/Post Construction Runoff Control

The revised SWMPP must address revisions to the local ordinances to ensure that: 1. New land development must employ stormwater controls to prevent any net increase in pollutants of concern (phosphorus) for sites contributing to MS4s which discharge directly to Gorton, Sand, and Warwick Ponds. Redevelopment projects must employ stormwater controls to reduce phosphorus to the maximum extent feasible.

Structural BMPs

This TMDL has determined that structural BMPs are necessary to improve water quality in Gorton, Sand, and Warwick Ponds. RIDEM has identified outfalls as priorities for treatment (Tables 4.3, 4.5, and 4.8 of the TMDL document). The City of Warwick must complete the identification, mapping, and determination of ownership of all outfalls to these ponds. Once identified, the City must assess the pollutant load and prioritize outfalls for treatment. SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls.

Buckeye Brook Watershed Bacteria TMDL – approved by US EPA 2/18/2009

SWMPP 6MM Modification - Illicit Discharge Detection and Elimination

During all surveys, pathogen concentrations were consistently highest in both Knowles and Lockwood Brooks. The City must provide an implementation plan with prioritization based on the results of the dry weather screening including work to investigate sources of elevated bacteria levels in these brooks. The City of Warwick and RIDOT are required to confirm ownership of outfalls identified in Table 4.2 of the TMDL.

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SWMPP 6MM Modification - Public Education and Outreach

The City of Warwick must amend its SWMPP to focus public education and outreach in the watershed that include education about the proper disposal of pet waste, discouraging large waterfowl populations, and prohibiting illegal tie-ins to storm drains.

SWMPP 6MM Modification - Post Construction Stormwater Ordinance

The City of Warwick must revise local ordinances to ensure that (1) New land development projects employ storm water controls to prevent any net increase in pathogen pollution, and (2) redevelopment projects employ stormwater controls to reduce pathogen pollution to the waterbodies in the watershed to the maximum extent feasible.

Structural BMPs

This TMDL has determined that structural BMPs are necessary to improve water quality in Buckeye Brook and tributaries. RIDEM has identified outfalls as priorities for treatment (Table 4.2 of the TMDL document). Operators of MS4s must work to identify other outfalls that contribute the greatest pollutant loads and prioritize these for BMP construction. The City of Warwick must complete the identification, mapping, and determination of ownership of all outfalls to these waters. SWMPP must establish a phased schedule for completing mapping and assessment task, and on prioritized basis, for completing catchment area analyses, design, and construction of structural BMPs. The selection of the location and type of BMPs must include delineation of catchment area, determination of interconnections with other systems, and evaluation of feasibility of distributing infiltration throughout the drainage area of priority outfalls.

Appendix II

Rhode Island Stormwater Utility Enabling Legislation (RIGL 45-61)
and CLF Report (executive summary)

Rhode Island General Law
TITLE 45
Towns and cities
CHAPTER 45-61
Stormwater Management Districts

45-61-1. Short title. -- This chapter shall be known and may be cited as the "Rhode Island Stormwater Management and Utility District Act of 2002."

45-61-2. Legislative findings. -- The general assembly hereby recognizes and declares that: The general assembly finds that stormwater, when not properly controlled and treated, causes pollution of the waters of the state, threatens public health, and damages property. Stormwater carries pollutants and other material from the land - such as human and animal waste, oil, gasoline, grease, fertilizers, nutrients, and sediments - into rivers, streams, ponds, coves, drinking water aquifers, and Narragansett Bay. Stormwater reaches the state's waters by streets, roads, lawns, and other means. As a result, public use of the natural resources of state for drinking water, swimming, fishing, shellfishing, and other forms of recreation is limited and in some cases prohibited.

The general assembly further finds that inattention to stormwater management results in erosion of soils and destruction of both public and private property, thereby putting public safety at risk and harming property values and uses, including agriculture and industry. Therefore, to help alleviate existing and future degradation of the state's waters and the associated risks to public health and safety, and to comply with state and federal stormwater management requirements, stormwater conveyance systems must be maintained and improved. The state of Rhode Island is delegated by the United States Environmental Protection Agency to implement "Phase II" stormwater management regulations, which require municipalities and other persons to increase their capacity to control stormwater. The Department of Environmental Management's Pollution Discharge Elimination System program has promulgated these regulations.

45-61-3. Declaration of purpose. -- The purpose of this chapter is to authorize the cities and towns of the state to adopt ordinances creating stormwater management districts (SMD), the boundaries of which may include all or part of a city or town, as specified by such ordinance. Such ordinances shall be designated to eliminate and prevent the contamination of the state's waters and to operate and maintain existing stormwater conveyance systems.

45-61-4. Powers of councils. -- The city or town council of any city or town in the state, by itself or with other cities and towns, pursuant to chapter 45-43, and in accordance with the purposes of this chapter, are hereby authorized to adopt ordinances creating stormwater management districts, which will be empowered, pursuant to such ordinance, to:

(1) establish a fee system and raise funds for administration and operation of the district. The fee system shall be reasonable and equitable so that each contributor of runoff to the system shall pay to the extent to which runoff is contributed; and the state shall be exempted from the fee system. However, the state Department of Transportation shall cooperate with the municipalities in the planning and implementation of wastewater management ordinances, including the providing of funds, if available, to match the fees collected by the municipalities annually.

(2) prepare long range stormwater management master plans;

- (3) implement a stormwater management district in accordance with regulations and model ordinances promulgated under this chapter;
- (4) retrofit existing structures to improve water quality or alleviate downstream flooding or erosion;
- (5) properly maintain existing structures within the district;
- (6) borrow for capital improvement projects by issuing bonds or notes of the city or town;
- (7) hire personnel to carry out the functions of the districts;
- (8) receive grants, loans or funding from state and federal water quality programs;
- (9) grant credits to property owners who maintain retention and detention basins or other filtration structures on their property;
- (10) make grants for implementation of stormwater management district plans;
- (11) purchase, acquire, sell, transfer, or lease real or personal property;
- (12) impose liens;
- (13) levy fines and sanctions for noncompliance;
- (14) provide for an appeals process;
- (15) contract for services in order to carry out the function of the district.

SECTION 2. This act shall take effect upon passage.

Stormwater Management Districts in Rhode Island: Questions and Answers



This document is intended to provide only generalized legal information. It is not intended either to provide legal advice or to create an attorney-client relationship, and it is not a substitute for consulting with an attorney regarding any specific questions or problems you might have.



Conservation Law Foundation
55 Dorrance Street
Providence, Rhode Island 02903
September 2013



**Rhode Island Bays,
Rivers, & Watersheds
Coordination Team**

Executive Summary and Recommendations

- A municipality may create an SMD by ordinance.
- Rhode Island law provides for fifteen enumerated powers that a municipality may grant to an SMD.
- SMDs may work with the Rhode Island Department of Transportation to undertake projects involving state property.
- SMD fees are highly likely to survive any legal challenge based on the argument that the fees are an illegal tax.
- Rhode Island law allows SMDs to adopt a fee system based on units approximating a property's impervious surface, called ERUs.
- SMDs may only charge fees to properties that discharge to a "stormwater conveyance system" within the SMD's boundaries.
- The term "stormwater conveyance system" may include streets, roads, and lawns.
- SMDs' boundaries can be as expansive as a group of municipalities may agree to – even covering the entire state if all cities and towns so agree – and as narrow as a small area within a single municipality.
- Because stormwater pollution is more a watershed problem than a municipal problem, CLF recommends that municipalities work together to create watershed-based SMDs.

Appendix III

Project Team & Phase I Feasibility Study Scope of Work

Appendix III – Project Team & Phase I Feasibility Study Scope of Work

Project Team Members

Project Management Team

Sheila Dormody
Director of Sustainability
City of Providence



Elizabeth Scott
Deputy Chief, Office of Water Resources
RI Department of Environmental Management



Consultant Team



Andrew Reese, Project Director
Rich Niles, Project Manager
Kerry Reed, Project Engineer
Kate England, Project Scientist



Prabha Kumar, Project Advisor



Jim Riordan, Project Engineer
Dean Audet, Project Advisor



Kevin Gould, Project Communications
Heather Conover, Project Advisor

Task 1 – Facilitation of Sustainable Stormwater Solutions Steering Committee

Under this task, a Sustainable Stormwater Solutions Committee (Steering Committee) composed of a representative(s) designated by the Mayor or City/Town Manager of each participating municipality and a representative of the Narragansett Bay Commission was convened. Four Steering Committee meetings were conducted to discuss various topics:

- Meeting #1: September 25, 2013. Kickoff meeting to orient the Steering Committee to the project goals, discuss the formation of the Stakeholder Group and to obtain feedback on stormwater program drivers and general concerns about a regional approach.
- Meeting #2: October 29, 2013. Reviewed local stormwater program information collected under Task 3 and the results of the Stakeholder Group Meeting #1. Discussed options for a regional approach and from these identified a preferred option for further analysis.
- Meeting #3: November 26, 2013. Reviewed the results of the Stakeholder Group Meeting #2. Guided discussion of funding approaches and the organizational, programmatic, and legal aspects of regionalizing stormwater management services, including advantages and disadvantages of adopting a regional stormwater utility.

Appendix III – Project Team & Phase I Feasibility Study Scope of Work

- Meeting #4: February 6, 2014. Presented the key Phase I Feasibility Study findings and discussed the next steps as they relate to future activities and funding for the in-depth planning study (Phase II).

Task 2 – Facilitation of Stormwater Stakeholder Group

Under this task, a Stakeholder Group was formed, consisting of individuals representing residents, businesses, institutions, community and environmental organizations, and other non-profits with interest in the creation of a sustainable revenue source to support stormwater management. The Stakeholder Group provided a sounding board and broad perspective to the municipalities' exploration of a regional stormwater utility and served as a communication channel to inform the larger community of interests about the feasibility study process. Three Stormwater Stakeholder Group meetings were conducted to discuss various topics:

- Meeting #1: October 28, 2013. Kickoff meeting to orient the Stakeholder Group to the project goals, discuss stormwater issues and funding, obtain feedback on stormwater program drivers and general concerns about a regional approach, and present an overview of regional approaches.
- Meeting #2: November 25, 2013. Provided an update on the analysis and feedback from Steering Committee Meeting #2 that included a review of the local stormwater program information collected under Task 3, options for a regional approach and the preferred option for further analysis identified by the Steering Committee.
- Meeting #3: February 25, 2014. Presented the key Phase I Feasibility Study findings and discussed the next steps as they relate to the in-depth planning study (Phase II), the future role for the Stakeholder Group, and strategies for public messaging and communication.

Task 3 – Analysis of Local Stormwater Programs

An analysis of the stormwater management programs in each municipality was completed through a survey/questionnaire developed by the Project Team, one-on-one half-day meetings with each participating municipality, and review of available information. This included a review of compelling reasons for action, program objectives and priorities, stormwater program costs, and any “show stoppers” for next steps. Since the program analysis was a fairly high level assessment, this report identifies where additional data analysis and program assessments are needed.

Based on available information and data provided by each of the participating municipalities, a profile for each municipal stormwater program was developed and includes:

- Overview of municipality: basic land use, leadership/governance, population, economic condition, key industries.
- Description and condition, if known, of stormwater system: miles of roads and drainage lines, #of catch basins, #of outfalls, #of structural BMPs.
- The municipal departments and staff involved in providing leadership to manage and implement the stormwater program, including their roles, duties, and responsibilities.

Appendix III – Project Team & Phase I Feasibility Study Scope of Work

- Compelling Issues: Identification of the problems, needs, issues, and goals of the existing municipal stormwater program, including status of compliance with the RIPDES MS4 General Permit, and any applicable TMDL requirements.
- Current Level of Service (LOS): Description of the current stormwater activities implemented under the existing municipal stormwater program.
- Current Cost of Services (COS): Description of the capital, operation and maintenance needs with costs for each municipality's stormwater program.
- Future Level of Service and Costs of Service: Identification of a five-year LOS scenario that meets MS4 permit requirements and addresses other stormwater issues. Developed a preliminary estimate of corresponding cost of services (capital and operation and maintenance).

Task 4 – Exploration of Regional Stormwater Management Alternatives

Under this task, the programmatic and organizational alternatives for regionalizing stormwater management services and creating a regional stormwater utility authority were discussed with the Steering Committee and Stakeholder Group. In addition, potential advantages and disadvantages of regionalizing stormwater services and adopting a regional stormwater utility were discussed, and any barriers or significant challenges to the creation of a regional stormwater utility were identified.

The following information was provided for the group discussions:

- Options for the organization of a regional stormwater authority including the extent of programmatic responsibilities vested with the regional authority and the relationship with municipalities in the district. The Steering Committee recommended one option for further in-depth evaluation during the next phase (Phase II) of the study.
- Organizational and programmatic aspects of the selected regional authority option.
- A Conceptual Regional Stormwater Program and a very preliminary estimate of stormwater billing units and costs.

Task 5 – Roadmap for Implementation of an Upper Narragansett Bay Regional Stormwater Utility

In this task, a "Roadmap" that included the key components of a process to design and implement a regional stormwater utility district for the Upper Narragansett Bay was developed. Each of those components would need to be fully addressed during the next phase that involves a more detailed feasibility study. This Roadmap was also included in the grant application that was submitted in January 2014, for the Hurricane Sandy Coastal Resiliency Competitive Grants Program (National Fish and Wildlife Foundation). The grant application seeks a planning grant to support the in-depth planning study (Phase II) that is necessary to further evaluate and plan for the implementation of a regional stormwater solution.

Appendix III – Project Team & Phase I Feasibility Study Scope of Work

Task 6 – Phase I Feasibility Report

This report is the Phase 1 Feasibility Report, and it incorporates the findings from the various project tasks and meetings, and also incorporates the comments from the Steering Committee and the Stakeholder Group. This report serves as the basis for the future work, and for Tasks 7 and 8.

Task 7 – Briefing Material and PowerPoint Presentation for Local Elected Officials

A briefing package and PowerPoint presentation of Phase I Feasibility Study findings was prepared for future informational presentations to the general public and elected officials.

Task 8 – Presentation to Local Elected Officials

The Project Team will be available to make one presentation to the City/Town Councils for each of the participating municipalities. Public presentations were completed at City Council meetings in Pawtucket on May 21, 2014 and Cranston on June 2, 2014.

Appendix IV

Stakeholder Group Invite Letter & List

**Meeting Materials for Steering Committee & Stakeholder Group
(chronology of agendas & meeting summaries); Presentations on CD**

Dear _____,

I am writing to invite you to participate as a member of a stakeholder group in a regional effort to evaluate alternative solutions to the problems of street flooding and water pollution caused by uncontrolled runoff. To address these problems, the communities at the head of Narragansett Bay are conducting a regional feasibility study of sustainable funding for effective stormwater management. You are invited to participate as a member of the Stormwater Stakeholder Group, which is part of this Upper Narragansett Bay Regional Stormwater Utility Feasibility Study.

Stakeholders will offer their input and share their thoughts and concerns. Our goal is to have discussions that will be both productive and result in constructive feedback to guide the next steps of the study.

Members will be requested to participate in a series of three (3) meetings before the end of January 2014. Each meeting will last for three hours and the following topics will be discussed: project background, objectives and water quality issues; stormwater management programs, potential regional approaches to management and funding; and presentation of the Draft Phase I Feasibility Report.

With funding and technical support from the RI Department of Environmental Management, the communities of Central Falls, Cranston, East Providence, North Providence, Pawtucket, Providence and Warwick, as well as the Narragansett Bay Commission, have begun the discussion of a regional approach to address stormwater and water quality issues. The study is being managed by a team of consultants experienced in local stormwater issues, stormwater financing and regional collaboration. This preliminary study is geared towards evaluating the financial, operational and management issues and needs of each community and exploring the viability of a regional stormwater management and funding strategies. The goal is to determine whether this approach makes sense for our communities and, if so, decide how it would need to be designed to meet our local needs.

The Stormwater Management Stakeholder Group will include individuals representing residents, business, institutions, community and environmental organizations with varying interests in stormwater management and how it will be implemented and funded in the future.

Please confirm your availability to participate in the Stormwater Stakeholder Group. It is important for stakeholders to have a voice in this process, and we hope that you will join us in this endeavor to responsibly manage our region's infrastructure and protect our natural resources. If you have any questions, please contact either Sheila Dormody or Elizabeth Scott below or one of the Steering Committee members on the attached list.

Sheila Dormody
Sustainability Director
City of Providence
(401) 421-2489 x714
Sdormody@providenceri.com

Elizabeth Scott
Deputy Chief, Office of Water Resources
RI Department of Environmental Management
(401) 222-4700 x7300
Elizabeth.Scott@DEM.RI.GOV

AMEC Environment & Infrastructure, Inc. (AMEC), the lead project consultant, and Conover + Company Communications are assisting with the logistics of formalizing the group and scheduling meetings. Therefore, please notify the following members of the Project Team regarding your decision **by Friday, October 18, 2013** so that we may formalize the group and send out meeting invitations: Rich Niles, AMEC at rich.niles@amec.com or Heather Conover, Conover + Company at hconover@conoverandcompany.com.

The first meeting is scheduled for the evening of October 28, 2013 from 5:00 to 8:00 p.m. Thank you for your time and we look forward to your participation in the Stormwater Stakeholder Group.

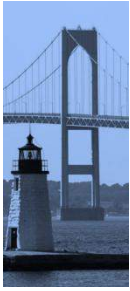
Best,

Rich Niles
Project Manager for AMEC Environment & Infrastructure, Inc.

Attachment – list of Steering Committee Members

Upper Narragansett Bay Stormwater Utility Study Stakeholders - List of Invitees

First	Last	Title	Organization	Email
Kristen	Adamo		Providence & Warwick Convention and Visitors Bureau	kadamo@goprovidence.com
Rev. Dr. Don	Anderson	Executive Minister	RI State Council of Churches	riscc@councilofchurchesri.org
Daniel	Beardsley		RI League of Cities and Towns, Exec Director	dan@rileague.org
Robert	Billington	Executive Director	Blackstone Valley Tourism Council	bvri@aol.com
Len	Bradley, P.E.	Vice President	DiPrete Engineering	len@diprete-eng.com
Shannon	Brawley		RI Nursery and Landscape Association	executivedirector@rinla.org
Michelle	Burnett	Flood Plain Manager	RI EMA	michelle.f.burnett@us.army.mil
Dave	Caldwell		RI Builders Association	dave.caldwell@caldwellandjohnson.com
Sandra	Cano			sandracanoforschoolcommitte@gmail.com
Scott	Duhamel		RI Building and Construction Trades	sduhamel@iupatdc11.com
Barnaby	Evans		Waterfire	barnaby@waterfire.org
Jon	Ford		Blackstone Park Conservancy	jford@morrisbeacon.com
Harold	Gadon	Chair	NBC Citizens Advisory Committee	hgadon7333@aol.com
Mike	Gazdacko	Director of Development	Urban Smart Growth	Michaelg@urbansmartgrowth.net
Gale	Gennaro		Providence College	GGENARO@providence.edu
Topher	Hamblett		Save The Bay	thamblett@savebay.org
Aaron	Hertzberg	Executive Director	Pawtucket Foundation	ahertzberg@pawtucketfoundation.org
Colin	Kane	Executive Director	I-195 Redevelopment District Commission	jbrodie@195district.com
Jason	Kelly		Moran Shipping	jkelly@moranshipping.com
Meg	Kerr		Environment Council of RI/ Blueways Alliance	megkerr@cox.net
Sheri	Lupoli		Groundwork Providence	slupoli@groundworkprovidence.org
Christine	Malecki West		Providence Environmental Sustainability Task Force	cw@kitearchitects.com
John	Marcantonio		Rhode Island Builders Association, Exec. Director	info@ribuilders.org
John	Marine		Osram Sylvania	JOHN.MARINE@SYLVANIA.COM
Mike	McCormick	Assistant Vice President, Planning, Design & Construction	Brown University	Michael_McCormick@Brown.EDU
Mike	McGivney	President	RI Shellfisherman's Association	mclamdigger@aol.com
Peter	Mello		Waterfire	peter@waterfire.org
Marcus	Mitchell		Mount Hope Neighborhood Association	mpm@isp.com
Chris	O'Connell		Dominion Energy	
John	O'Flaherty		Community Boating	johnof@communityboating.com
William	Ostiguy		Ferguson Perforating	wostiguy@fergusonperf.com
Joe	Paolino, Jr.		Paolino Properties	info@paolinoproperties.com
Marc	Petrowicz	President	RI Nursery and Landscape Association	
Jamie	Rhodes		Clean Water Action	jamierhodes@cleanwater.org
Jack	Silva	A.V.P. of Facilities & Safety	Rhode Island School of Design	jsilva@risd.edu
John	Simmons		RI Public Expenditures Council, Exec. Dir.	j_simmons@ripec.com
John	Sinnott		Gilbane Building Company, District Manager	jsinnott@gilbaneco.com
Steve	Stycos			ch1650@pol.net
Mike	Tamburro	President	Pawtucket Red Sox	mat@pawsox.com
Mark	Van Noppen	Vice President, Managing Director	Armory Revival Company	mvanoppen@armoryrevival.com
Laurie	White		Providence Chamber of Commerce	lwhite@provchamber.com



Sustainable Stormwater Solutions Steering Committee

September 25, 2013 Kick-off Meeting

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Rhode Island Foundation
One Union Station
Providence, RI 02908

Agenda:

- | | |
|---------------------------|---|
| 8:30 a.m. | ARRIVAL & SIGN-IN |
| 9:00 - 9:30 a.m. | INTRODUCTION AND MEETING OBJECTIVES <ul style="list-style-type: none">• Project Road Map• Meeting Schedule• Participation & Ground Rules |
| 9:30 - 9:50 a.m. | EXPECTATIONS & CONCERNS |
| 9:50 - 10:05 a.m. | NARRAGANSETT BAY COMMISSION <ul style="list-style-type: none">• Project Role/Interest• Current Stormwater Management Program |
| 10:05 - 10:40 a.m. | MUNICIPAL DISCUSSION <ul style="list-style-type: none">• Activity: The Case for Stormwater Funding |
| 10:40 - 10:50 a.m. | BREAK |
| 10:50 - 11:25 a.m. | REGIONAL STORMWATER UTILITIES <ul style="list-style-type: none">• Activity: Consideration of Options |
| 11:25 - 11:45 a.m. | DISCUSSION OF STORMWATER STAKEHOLDER GROUP <ul style="list-style-type: none">• Review of Preliminary List• Discussion/Brainstorm |
| 11:45 - 12:00 noon | LOOKING FORWARD & FINAL REMARKS |
| 12:00 noon | ADJOURN |



**Sustainable Stormwater Solutions Steering Committee
September 25, 2013 Kick-off Meeting**

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Meeting Summary

Meeting Date: Wednesday September 25, 2013
Time: 9:00 a.m. to 12:00 p.m.
Location: The Rhode Island Foundation, One Union Station, Providence, RI
Prepared by: Kevin Gould/James Greiman (Conover + Company Communications)
Rich Niles/Andy Reese (AMEC)

Attendees:

Steering Committee

Dave Everett – City of Providence	Erik Skadberg – City of East Providence
Josh O'Neill – City of Providence	Ray Marshall – Narragansett Bay Commission
Jason Pezzullo – City of Cranston	Tom Uva – Narragansett Bay Commission
Ken Mason – City of Cranston	Marie Twohey – City of Central Falls
Edward Tally – City of Cranston	Elaine Partridge – City of Central Falls
Louis Lanni – North Providence	Elizabeth Scott – RIDEM
Andrew Silva – City of Pawtucket	

Project Team

Andy Reese – AMEC	Kevin Gould – Conover + Company Communications
Rich Niles – AMEC	James Greiman – Conover + Company Communications
Kate England – AMEC	Jim Riordan – Fuss & O'Neill
Kerry Reed – AMEC	

Observers

Meg Kerr – Narragansett Bay Estuary Program
Carissa Lord – RIDEM
Sheila Dormody – City of Providence
Topher Hamblett – Save the Bay

Discussion Topics:

Attached for reference are the meeting agenda and PowerPoint presentation that serve as the basis for the meeting and discussion.



1. Overview

The meeting began with an overview of the project (reference slides 4-7).

- This first phase is a data-gathering process.
- Steering Committee members were asked to consider this “their” project by:
 - Actively participating in open, honest discussion of key issues and concerns
 - Helping to identify stakeholders to participate in the process
 - Assisting with data collection at the municipal level

2. What do I hope to get out of this process? What am I concerned about?

Steering committee members were asked to share their thoughts regarding what they hoped to get out of the process and what concerns they had at the outset. The following is a summary of responses (reference slides 10-12):

Education and Involvement

- Create an ability to explain this to political leadership
- Create an ability to explain the benefits even to local municipalities that are facing financial hardship
- Define long term benefits and short term costs in an attractive and real way
- Be able to quantify the financial gap in simple clear terms
- Understand and be able to speak to the public perceptions and natural opposition to higher fees
- Be able to differentiate between sewer and stormwater fees, and fees and taxes
- Understand the value of past investments – and the return on investment going forward

Cooperation

- Facilitate cooperation among communities
- Create realistic expectations or objectives, cost and time frame
- Define a geographic size or membership for the group that is realistic
- Define an approach wherein a single entity cannot stall progress
- Define a realistic and helpful state role
- Define a realistic and helpful RIDOT role
- Insure we gain efficiencies through cooperation

Program

- Take full advantage of experiences elsewhere
- Insure all stormwater needs are met, not just water quality (i.e. FEMA)

3. Narragansett Bay Commission (NBC) presentation

This portion of the meeting covered the challenges and questions that NBC faces regarding the development and implementation of its improvement projects and their initial feedback on the Phase I study. A handout was provided for participants, titled “Stormwater Mitigation Plans: A Comprehensive Approach to a Century Old Problem” and is attached for reference. Information discussed by the NBC is summarized below:



- NBC is investing \$1M/week in water quality improvement (CSO) projects. Phase III of the Long-Term Control Program is expected to cost \$500-600M with a significant investment in green infrastructure and other approaches aimed at reducing the effort and cost for final implementation.
- NBC has been able to gain public acceptance of stormwater management and green infrastructure approaches with large institutions, such as Providence College.
- Approximately 6.5MG of stormwater flow has been removed from the storage tunnel, essentially preserving 10% of the capacity and allowing for additional treatment. The NBC recognizes that stormwater improvements to address the volume of runoff assist in the overall management of its infrastructure and improvements to water quality.
- NBC works to educate developers about improvements now that can save money later. Most of the projects that appear before the NBC for review are redevelopment.
- Stormwater regulations for redevelopment only require water quality to be addressed. Does NBC have water volume requirements?
- NBC would like to see communities adopt their stormwater regulations.
- Stormwater (i.e. from roof drains) end up in the sewer system.
 - People are disconnecting roof drains and dumping onto lawn, which raises groundwater levels and gets into basements.
- NBC is not currently authorized to charge a stormwater fee.
- NBC is the only organization of its kind that is regulated by the Public Utilities Commission (PUC).
- NBC is willing to share information and provide advice and guidance to municipalities.

4. Compelling stormwater issues in my community

The group was asked to voice their biggest concerns related to stormwater in their community (reference slides 15 & 16). Responses were listed, discussed and the following is a summary of the top 4 major categories:

- Aging Infrastructure
- Flooding Issues
- TMDLs and Water Quality Issues
- Recreation and Quality of Life

The specific issues/concerns are listed below with the number of votes provided by participants. Participants were given 5 votes and limited to 1 vote each per issue/concern (note: not all participants voted each time).

To allow for further analysis, the votes were organized into groupings under major topic headings based on shared or overlapping interest. There is admittedly some interpretation of commentary, but the general pattern is sound.

As can be seen from the table water quality, flooding and infrastructure needs were, for all intents and purposes, considered of equal importance by the steering committee. While there was more diversity of topics for water quality, probably due to its inherent complexity, the summation is equivalent to the other two.



Total Votes	Issue Votes	Topic or Program Focus
26		WATER QUALITY
	6	TMDLs and Future Needs
	6	Water Quality Treatment is Not Done
	6	Recreation, Quality of Life, Beaches
	3	Incentives for Green Infrastructure
	2	Under-drains for Sanitary Sewers (discharge to water bodies)
	2	Standards are Too High (implying water quality goals)
	1	Compliance (RIPDES Permits)
	0	Ecology and WQ Impacts
26		FLOODING
	8	Flooding Streets
	8	Handling of Roads (e.g., DOT)
	6	Flood Mitigation
	4	Development Impacts
24		INFRASTRUCTURE
	11	Aging Infrastructure
	8	Asset Management (understanding infrastructure)
	3	Identification and Prioritization of Issues
	2	Maintenance of Minor Systems
11		POLICY & ADMINISTRATION
	5	Enabling Legislation Exemptions (for a stormwater utility district)
	5	Prevention & Education
	1	Inconsistent Standards (NBC, Cities, RIDEM Manual)

5. What do you think a regional stormwater management approach would look like?

The Steering Committee was presented with a matrix containing a range of options for a regional stormwater management approach; along with examples from across the country (reference slides 21-28). The group felt that having these examples from other regions was important to understanding the different models and would be an important part of discussing regionalization with their municipal stakeholders.

The meeting participants were then asked to indicate which management approach(es) on the matrix seemed to be the most appropriate, understanding there would be further discussion of the approaches at the next Steering Committee meeting. The majority of steering committee members wanted to see a shared program (opportunity for collaboration) with some independent control over funding and local priorities.

A few of the respondents felt that more of an umbrella program might be easier to manage but would come at the loss of some local control. Options #5, #6 and #8 on the matrix below were the scenarios that were referenced the most during the discussion.



	Independent Funding	Each Has Its Own Fee	One Umbrella User Fee
Independent Programs	Move ahead independently ¹	Gain economies in fee development only ²	Create an organization to collect and disburse funds only ³
Cooperative Overlapping Program Parts	Each decides how to pay for partially cooperative program ⁴	Cooperate on similar fee and shared program where it makes sense ⁵	One "look" to citizens with cooperation in parts of program ⁶
One Umbrella Program	Each decides how to pay share of one program ⁷	Avoid financial entanglement but gain economy ⁸	Each gives program and authority to separate agency ⁹

The following are some key points brought up during the discussion:

- Would like to see joint compliance to "level the playing field".
- A joint fee is desirable.
- There needs to be some local responsibility to implement activities.
- A regional program provides for a pool of funding for larger projects.
- A regional program could consider sub-groups with varying needs and levels of service.
- Need to clearly identify the differences between CSS, sanitary sewer and stormwater infrastructure and needs.

The Project Team emphasized that the matrix is intended to represent a range of options and most regional approaches do not fit neatly into one or the other. The feedback from this discussion was intended to provide guidance to the Project Team to present options for a regional approach at Meeting #2 that fit within the range of expectations from Steering Committee members.

Other ideas discussed:

- Larger communities have more in common than the smaller communities – maybe subgroups?
- NBC doesn't provide services to everyone, how does this program relate to CSS?
- If there is a separate sewer system, why should we have to deal with combined systems? Why should we have to pay?
 - East Providence has its own treatment plant on the south side.
- Stormwater/wastewater divide. How does the public view this? Public can't see NBC project or TMDL results, but can see flooding in their basements. How do we get people to relate to this?



6. Discussion of Stormwater Stakeholder Group

The Steering Committee was asked to list any other missing stakeholder groups that should be informed about the program. The following were identified in addition to those on slide 30:

- Shell (and other) fisherman
- Recreation users (boating organizations)
- Tourism councils and Chambers of commerce
- Sports arenas
- Car dealerships
- Private schools
- Transportation authorities (trains, buses, airport)
- I-95 Redevelopment Commission
- Emergency management
- Large property owners
- Agriculture
- Federal properties
- PUC

Other stakeholder audiences were noted and the group discussed pros/cons of when and how to engage these audiences:

- Media
- Town Government
- Legislature

How will these stakeholders help shape this effort? Who in your community needs more information on an idea like this? Potential opponents and proponents need to be involved.

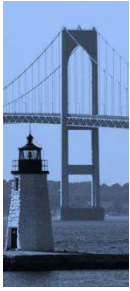
The group discussed the flow of information to both the public and the media, noting the following:

- Need to frame the story as a regional issue not just one small town or area.
- General consensus is that stormwater and wastewater are separate in most instances and should stay that way.
- Public has very different perceptions from those at the meeting.
 - Again, public education is key to the success of the program.
- Responsibility is at a local level but needs to be managed at a regional level.

The group felt that as the project moved forward, a brief set of clear talking points would be needed for Steering Committee members to use with the above key audiences and that careful consideration should be given to how/when to engage them in the process since everyone is at the very initial stages of working on a conceptual idea for a regional approach and there is a lot of “raw” discussion that will take place.

7. Closing

The meeting concluded with a reminder that the goal for this first phase of the study is to determine whether or not the group believes that some type of regional approach should be considered further and that we should keep moving the discussion forward.



Stormwater Stakeholder Group
October 28, 2013 Kick-off Meeting #1

Phase I – Upper Narragansett Bay
Regional Stormwater Utility Feasibility Study

Rhode Island Department of Environmental Management (RIDEM)
235 Promenade Street, Room 300
Providence, RI 02908

Agenda:

- | | |
|-------------------------|--|
| 4:30 p.m. | ARRIVAL & SIGN-IN |
| 5:00 - 5:15 p.m. | INTRODUCTIONS AND PURPOSE OF GROUP |
| 5:15 - 6:05 p.m. | STORMWATER ISSUES AND FUNDING <ul style="list-style-type: none">• Overview of Stormwater Issues• Problems in the Region• Funding & Stormwater Utilities |
| 6:05 - 6:15 p.m. | PROJECT OVERVIEW <ul style="list-style-type: none">• Project Road Map & Schedule• Participation & Ground Rules |
| 6:15 - 6:30 p.m. | BREAK |
| 6:30 - 7:20 p.m. | STAKEHOLDER DISCUSSION <ul style="list-style-type: none">• Concerns & Expectations• The Case for Stormwater Funding |
| 7:20 - 7:50 p.m. | REGIONAL STORMWATER INITIATIVE <ul style="list-style-type: none">• Overview of Regional Approaches• Activity in Progress |
| 7:50 - 8:00 p.m. | LOOKING FORWARD |
| 8:00 p.m. | ADJOURN |



**Sustainable Stormwater Solutions Stakeholder Group
Meeting #1
October 28, 2013**

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Meeting Summary

Meeting Date: Monday October 28, 2013
Time: 5:00 p.m. to 8:00 p.m.
Location: RI Department of Environmental Management, Providence, RI
Prepared by: Kevin Gould/James Greiman (Conover + Gould Strategic Communications) Rich Niles/Andy Reese (AMEC)

Attendees:

Stakeholder Group

Len Bradley - DiPrete Engineering
Barnaby Evans - WaterFire
Jonathan Ford - Blackstone Park Conservancy
Gale Gennaro - College office of Environmental
Meg Kerr - Environment Council of RI/Blueways
Topher Hamblett - Save the Bay
John Sinnott - Gilbane Building Company
Bob Vanderslice - RI Dept of Health

Lauren Carson - Clean Water Action
Sheri Lupoli - Groundwork Providence
Kurt Teichant - Brown University
Marcus Mitchell - Mt. Hope Neighborhood Association
Marc Petrowicz - RI Nursery & Landscape Foundation
Mark Van Noppen - Armory Revival Company
Dave Caldwell, Jr. - RI Builders Association

Project Team

Andy Reese - AMEC
Rich Niles - AMEC
Kate England - AMEC
Kerry Reed - AMEC
Pamela Lemoine - Black and Veatch

Prabha Kumar - Black and Veatch
Kevin Gould - Conover + Gould Communications
James Greiman - Conover +Gould Communications
Jim Riordan - Fuss & O'Neill
Elizabeth Scott - RI DEM

Observers

Meg Kerr - Narragansett Bay Estuary Program
Sheila Dormody - City of Providence
Josh O'Neill - City of Providence

Discussion Topics:

Attached for reference are the meeting agenda and PowerPoint presentation that served as the basis for discussion at Meeting #1. Topics are outlined below according to the presentation with information relevant to the discussion or comments during the meeting.



1. Introduction/ Purpose of Stakeholder Group

The meeting began with an overview of the project roadmap, purpose of the group and ground rules for meetings. The main goal of the study is to assess the feasibility of a regional approach and funding mechanism for stormwater management. There were no significant comments or discussion.

2. Stormwater Issues

This portion of the meeting covered the reasons why stormwater management has become such a pressing issue in the state of Rhode Island. Various examples were cited that detailed how extensive the issue was for not only the City of Providence but also the entire Narragansett Bay Region. Below is a summary of the information discussed and presented by the Project Team.

- DEM (RI Bays, Rivers & Watersheds Coordination Team) is funding the first part of the study to assess the feasibility of the project, next steps and estimated costs.
- This project is not a mandate from DEM. There are lots of mandates that municipalities and residents are subject to and RIDEM wants to help address them as efficiently and effectively as possible.
- Regional stakeholders are key to the success of the study and the project as a whole.
- Many municipalities are not fully complying with existing permits and legislation.
- The impact of stormwater is far greater in urbanized areas where there are very high percentages of impervious surfaces.

Slide #8 (to the right) summarizes the most pressing problems within the state of Rhode Island, as identified by the Project Team. Below is a summary of discussion related to some of these issues:

Flooding:

- Example was given of an apartment building flooding that displaced residents and caused \$1 million in damage.
- Another example cited a tenant at Rising Sun Mills that didn't renew its lease due to flooding concerns.
- Primary floodplain concerns: Economics, health and safety.

Beach Closures (commercial and recreational):

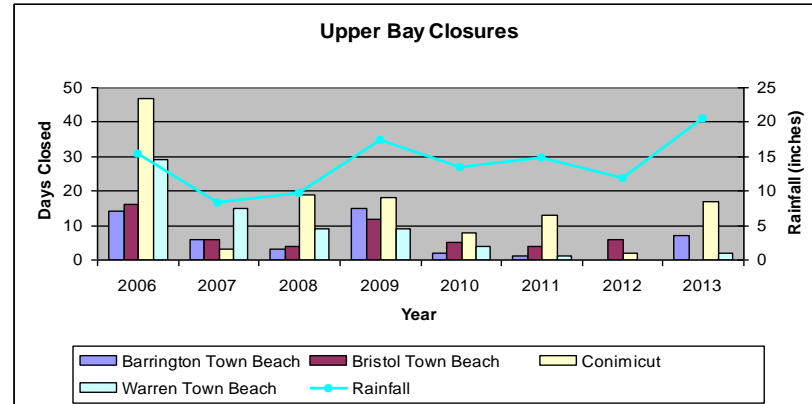
- Impaired waters in the state are not meeting state standards.
- Greenwich Bay that closes due to certain amounts of rainwater and stormwater runoff.
- Shellfish closures have a negative impact on the economy in real dollars.
- Improvements from NBC efforts are visible. For example, at Conimicut Beach, there are fewer closures in recent years as a result of infrastructure improvements to address stormwater runoff.
- The graph below illustrates the relationship between rainfall and closures at various beaches within the state in recent years.



Overview of Stormwater Issues

- Chronic Street Flooding
- Floodplain Concerns
- Impaired Waters
- Shellfish Area Closures
- Beach Closures
- Polluted Freshwater Ponds
- Sediment Filled Waterways





Freshwater:

- Stormwater runoff has polluted freshwater bodies throughout the state.
- Cyanobacteria has infiltrated the water and is causing algae blooms that release toxins, cause oxygen deficits and cause excessive plant growth.
- Nutrient loadings from fertilizer can produce toxins that can be harmful to pets and may be linked to neurological diseases.
- Sediment filled waterways results in impacted water quality, aquatic life and recreation.

General Discussion:

- Example initiatives to combat these problem within the state include:
 - Permits for construction and redevelopment projects.
 - RIPDES Phase II General Permit Program Requirements.
 - Stormwater Management Program Plan.
 - Describes how pollution can be reduced within municipalities.
- Municipalities have a significant number of responsibilities placed on them from RI DEM. They don't have adequate funding to do it. This is why we are here.

3. Funding and Utilities

- What is a Stormwater Utility (Slides 24-38)
 - Stakeholder Group: would there be a tax decrease?
 - Project Team: yes, some of the existing program costs would shift from the general fund to the stormwater utility.
 - Stakeholder Group: would property owners be responsible for their part of the system?
 - Project Team: yes, properties that contribute to the system or place a burden on the system would pay their equitable share of the stormwater program.
 - Stakeholder Group: what benefits would there be with a regional system?
 - Project Team: this will be discussed later in the meeting.
- Mean and median costs of stormwater utilities nationwide (slide #40):
 - Median - \$3.50, mean - \$4.10/cost per month
 - Stakeholder Group: how would users of the system be billed?
 - Project Team: billing can be handled in a variety of manners, but it can be done with water and sewer bills, tax bills or separate stormwater bills.
- General Comments:
 - Municipalities cannot solve the problems with stormwater alone, DOT needs to be involved due to interconnected systems.
 - Highways runoff is a significant contributor to stormwater issues.



4. Group Feedback & Discussion

The Stakeholder Group was asked to state an important problem or issue that they hoped a regional stormwater management approach would address. The following list was generated from the Stakeholder Group and each of the participants were asked to vote on their top 8 items (8 votes/person). The Project Team later grouped each of the items into broader categories.

Topic	Votes	Category
Benefits of green even with grey	9	1
Zoning and other hurdles	7	2
Connect infrastructure and landuse	7	2
Incentives	7	2
Positive health aspects	7	4
Flooding	7	5
Maintenance	7	6
Education	6	1
Water as a resource	6	5
Navigation and sediment	6	6
Ecology	6	7
Frame the argument well	4	1
Enforce rules we have - variances	4	2
Financial positives of this	4	3
We spend a lot now	4	3
Regional disaster planning	4	5
Overcome apathy	3	1
Invisible problems	3	1
Weary and wary of government	3	3
Cost effectiveness	3	3
Out of money	3	3
Loss of redevelopment land	3	4
Loss of historic properties	3	4
Help regional compliance	3	7
At risk population issues	2	4
Climate change	2	5
Fertilizer and pesticide	2	7
Ease of access	1	2
Inconsistent criteria	1	2
Uncontrolled infill	1	2
One stop for everything water	1	2
Mudflat views	1	3
FEMA program interaction	1	5
HOA defunct	0	2
Affordability	0	3
Septic tank pollution	0	7
EPA requirements	0	7



The following table summarizes the ranking of the key categories of issues, based on the voting from the Stakeholder Group.

Rank	Category		Total Votes
1	2	Policy	29
2	1	Education	25
3	5	Flooding	20
4	3	Cost Related	18
5	4	Social and Landuse	15
6	6	System	13
7	7	Water Quality	11

5. Regional Stormwater Initiative (Slides 43-49)

The Project Team presented information on the concept of regionalization with some examples of existing regional stormwater organizations. The Stakeholder Group was then asked to provide feedback with the following thought in mind: “In looking at these approaches and my first thought, I would want the Steering Committee to think about . . .”

General Discussion:

- Wondering how administration of a regional utility would work.
- Concerns about fairness and social equity:
 - Some might not be able to afford a new bill.
 - Municipalities have different levels of previous investment.
 - Can it be pooled with general revenue or must we account for it separately?
 - How to sell the concept.
 - Will raise questions from residents:
 - Where did all the money go already?
 - Aren't we spending enough?
 - Money was being collected but was it used for the expected purpose? A user fee would be dedicated and could address this issue.
 - How would it be billed? Most are collecting through a combined water/sewer bill.
- The Project Team explained that RI law allows for adoption of ordinances to create stormwater management authorities and charge fees. The law addresses equitability and exempts state properties from being charged a fee, but non-profits and other tax-exempt properties would be subjected to the fee. No one in RI has taken advantage of this law yet.
- RI DEM met with RI DOT to discuss interconnections and cooperation. It makes sense to include them as a part of this discussion and they have committed to participating. RIDOT is trying to address stormwater runoff with reconstruction of I-195 viaduct.
- Stakeholder Group Feedback on Regional Examples:
 - The Denver program appealed to many in the group as it highlights visible “water as a resource” projects which would be appropriate for the RI as the “Ocean State”.
 - The Denver program was also appealing due to its commitment to public use (other models do it too.)
 - We like the idea of giving money back to towns to make sure streets and catch basins are cleaned.



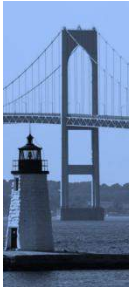
- Would there be a supervisory role to make sure catch basins would be cleaned?
- What are these programs doing that is innovative? Is innovation part of the program model?
- Can we build on NBC instead of creating a separate program?
 - Already regional, respected and well run.
 - Just raised their rates and won't want to add another fee.
 - CSO initiative is demanding on staff.
 - NBC does interceptors and treatment. Smaller pipes belong to town.
 - NBC does permitting for projects.
 - NBC handles large infrastructure and may not be willing to take on lots of smaller projects, as well as operation and maintenance.

Pros and Cons of Creating a New Regional Entity:

The Stakeholder Group was asked to provide their thoughts on the pros and cons of creating new regional entity for stormwater management in the Upper Narragansett Bay area.

Pros	Cons
Focus for public understanding	New people new focus, different mindsets
Explicit focus	Another bureaucracy
New people addressing the issues	Resistance to giving up authority
May have less hurdles to overcome	Resistance to any type of regionalization effort
Good test project	Perception that it will cost more money
Galvanizing concept	
Could save money through centralized, efficient effort	

6. Looking Forward: no significant discussion



Sustainable Stormwater Solutions Steering Committee

October 29, 2013 Meeting #2

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Rhode Island Department of Environmental Management (RIDEM)
235 Promenade Street, Room 300
Providence, RI 02908

Agenda:

- | | |
|---------------------------|---|
| 8:30 a.m. | ARRIVAL & SIGN-IN |
| 9:00 - 9:15 a.m. | ROAD MAP, SCHEDULE AND MEETING #1 REVIEW |
| 9:15 - 9:25 a.m. | STAKEHOLDER GROUP UPDATE <ul style="list-style-type: none">• Discussion & Feedback |
| 9:25 - 9:40 a.m. | FINDINGS: PROGRAMS AND PERSPECTIVES <ul style="list-style-type: none">• Common Characteristics• Discussion & Feedback |
| 9:40 - 9:55 a.m. | BREAK |
| 9:55 - 11:35 a.m. | PRELIMINARY REGIONAL APPROACHES <ul style="list-style-type: none">• Review & Discussion of Approaches• Activity: Narrowing Approaches |
| 11:35 - 11:45 noon | LOOKING FORWARD |
| 11:45 a.m. | ADJOURN |



**Sustainable Stormwater Solutions Steering Committee
Meeting #2
October 29, 2013**

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Meeting Summary

Meeting Date: Tuesday October 29, 2013

Time: 8:00 a.m. to 12:00 p.m.

Location: RI Department of Environmental Management, Providence, RI

Prepared by: Kevin Gould/James Greiman (Conover + Gould Strategic Communications)
Rich Niles/Andy Reese/Kerry Reed (AMEC)

Attendees:

Steering Committee

Bill Bombard – City of Providence	Elaine Partridge – City of Central Falls
Dave Everett – City of Providence	Marie Twohey – City of Central Falls
Josh O'Neill – City of Providence	Erik Skadberg – City of East Providence
Eric Hindinger – City of Warwick	Tom Uva – Narragansett Bay Commission
Ken Mason – City of Cranston	Pamela Reitsma – Narragansett Bay Commission
Edward Tally – City of Cranston	
Louis Lanni – North Providence	Peter Healey – RIDOT
Andrew Silvia – City of Pawtucket	

Project Team

Andy Reese – AMEC	Kevin Gould – Conover + Company Communications
Rich Niles – AMEC	James Greiman – Conover + Company Communications
Kate England – AMEC	Jim Riordan – Fuss & O'Neill
Kerry Reed – AMEC	Prabha Kumar – Black and Veatch
Elizabeth Scott – RIDEM	

Observers

Meg Kerr – Narragansett Bay Estuary Program
Sheila Dormody – City of Providence
Topher Hamblett – Save the Bay

Discussion Topics:

Attached for reference are the meeting agenda and PowerPoint presentation that serve as the basis for the meeting and discussion.



1. Road Map, Schedule & Meeting #1 Review

The meeting began with a review of the project road map and schedule (reference slides 4-5).

- Upcoming meetings
 - Steering Committee Meetings (2): Nov 26, 2013 and early Jan 2014
 - Stakeholder Group Meetings (2): Nov 25, 2013 and early Jan 2014
- Further analysis of local stormwater programs & exploration of regional management approaches
- Road Map for Regional Stormwater Utility & Feasibility Report: end of Jan 2014

The Project Team reviewed the results of the Stakeholder Group Meeting #1 held the previous night. 17 stakeholders attended the meeting (listed on slide 9) representing: developers, real estate, landscapers, neighborhood associations, watershed groups, universities, and the Department of Health. The stakeholder group was asked to share their thoughts regarding what they hoped to get out of the process and what concerns they had at the outset (reference slides 10 – 11). The following are the top responses that received 6 or more votes:

- | | |
|--|-----------------------------|
| 1. Benefits of green even with grey | 7. Maintenance |
| 2. Zoning & other hurdles | 8. Education |
| 3. Connect infrastructure and land use | 9. Water as a resource |
| 4. Incentives | 10. Navigation and sediment |
| 5. Positive health aspects | 11. Ecology |
| 6. Flooding | |

2. Findings: Common Characteristics of Local Programs

The Project Team presented the follow general findings from the meetings with each Steering Committee participant regarding their programs (reference slides 10-12):

- Programs – Most local stormwater programs are reactive with limited funding. Most have limited CIP programs that focus on flooding issues with water quality projects dependent on grant funding.
- Systems – Most communities have a complex interspersed CSS and MS4 collection areas. Cranston, East Providence and Warwick operate their own CSS and sanitary systems, while the others work with NBC.
- Perspectives
 - All communities are concerned about the new regulatory requirements for MS4s and the potential costs associated with them.
 - There is a wide range of program investment and condition of stormwater assets amongst the communities.
 - NBC could provide an important role in a regional stormwater program since it is already an effective regional entity.
- Potential Concerns
 - Loss of control/ creation of another entity.
 - Fee creep.
 - How cost will look to each individual constituency.
 - Inequity of current and past levels of investment by community.
 - Will there be a consistent level of service across system? Will new entity perform at a level that each municipality expects?



3. Regional Approach

The goal of this portion of the meeting was to develop a preferred regional approach to be considered for further evaluation under the regional feasibility study. The Project Team reviewed aspects of regional programs, framework for consideration, assumptions, and objective criteria (reference slides 20 – 25).

“Regional” stormwater programs were explained as comprising one or more of the following: regional program management, regional organization, or regional funding. The Project Team emphasized that although one preferred regional approach would be considered for further evaluation, that approach may be transitional and not permanent. The Project Team requested that Steering Committee members only voice concern about details of the regional approach options if they point out: a fatal flaw or an insurmountable hurdle. It is important to note that the matrix of regional approaches was developed by the Project Team for review by the Steering Committee members.

The Steering Committee was asked to consider following five major program elements:

1. CSS laterals.
2. Water quality.
3. MS4 collector system.
4. Streams and floodplain management.
5. Stormwater review and support for development.

Next the Steering Committee was asked to consider their preference for how each of those above 5 elements should be handled: regionally or locally. The Project Team provided several potential regional program approaches with a combination of regional or local major program elements as summarized below (reference slide 33). The preliminary approaches focused on preferences for regional program management. Regional organization preferences included the option of either “NBC” or “Regional” as the regional entity; in which “Regional” would be a new, separate regional entity. For regional funding options, during this exercise fees were assumed to be collected regionally but redistributed to the communities for implementing “local” program elements.

- Approach A
 - Local Governments manage CSS laterals; explained as everything up to the interceptors.
 - Regional entity responsible for all other elements.
 - Local governments would have little stormwater responsibility.
- Approach A1- NBC responsible for (#1) CSS Laterals
 - Similar to option A, but NBC would have responsibility for all CSS infrastructure.
- Approach A2 – Local community responsible for (#5) Stormwater Review
 - Similar to Option A1, but local communities maintain control of stormwater review to provide more local control and ease of development review.
- Approach B
 - NBC would be responsible for (#1) CSS laterals.



- Regional entity would be responsible for (#2) Water Quality and (#3) MS4 collector systems (e.g. pipes, catch basins, man holes, outfalls, BMPs) and local flooding resulting from issues with infrastructure.
- Local governments would be responsible for (#4) streams and floodplain management and (#5) review of stormwater design and studies for permitting and development.
- Approach B1- Local governments are responsible for (#3) MS4 system
 - Similar to option B, but local communities would also have responsibility for their own MS4 infrastructure.
 - In option B1, the regional entity is only responsible for water quality and not stormwater infrastructure.
- Approach C & C1
 - Similar to option B & B1, but NBC was recognized as the specific organization for the regional entity.

For all the options, the Steering Committee voiced concern about the complex allocation of funds and ensuring that each participating community got their fair value back.

The following pros and cons were discussed for Approach A:

PROS	CONS
Takes burden off of understaffed municipalities.	One more level for developers to have to go through for approvals. Could be overcome through a one-stop shop service.
Funding will be stable and dedicated for numerous program elements.	Residents being concerned about regional authority's responsiveness to local issues like flooding events.
Watershed planning for water quality and flooding. TMDLS addressed regionally.	Additional overhead costs.
Economies of scale – work shared and equipment shared means lower local operating costs.	Prioritization of projects may result in funding going to projects in other communities. Fee payers may not see immediate benefit since it's not in their town.
TMDLs addressed regionally.	Might not see local projects.
Dedicated professional stormwater staff can provide technical support.	

The following pros and cons were discussed for Approach B:

PROS	CONS
More local control and flexibility.	Concern about fees returning to local towns.
More responsive to citizens.	Spending controlled by local councils.

The following pros and cons were discussed for Approach C:

PROS	CONS
NBC already successfully runs a regional program.	Currently, the NBC is only responsible for CSS from the interceptors to the plant.
NBC already has a billing system and administrative support. Wet weather fee component can be added.	Not all the communities in the regional study use NBC. What would be the perception of those users receiving a bill from NBC?
Integrated approach for water quality.	NBC does not currently have the regulatory authority to manage stormwater.



A member of the group suggested an Approach D – “Do Nothing” in which all program elements remained local. The group discussed reasons that a “Do Nothing” approach would be a consideration:

- Concerns about another fee for residents, particularly in economically challenged communities where people are already struggling to pay existing utility fees.
- Towns who are doing things right don’t want to pay/support others who aren’t.

The group was asked to conduct a straw poll to rank each of the options from 1 – 5 with 1 being the most negative and 5 being the most positive. This ranking is displayed in the left hand column of the table below. Under each approach in the following table is the number of votes for that approach. The results were then given a weighted score by multiplying the number of votes by the rank. The total with the highest number is the most favorably received option.

	Approach A	Approach B	Approach C	Approach D
1	1	0	3	4
2	1	4	5	2
3	2	4	2	1
4	7	3	0	2
5	0	0	1	2
Totals	37	32	24	29

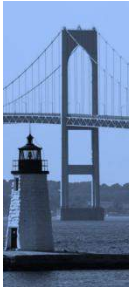
The straw poll was then recalculated using a different scale with -2 to 2 with -2 being the most negative, 2 being the most positive, and 0 being neutral. The results are summarized in the following table.

	Approach A	Approach B	Approach C	Approach D
-2	1	0	3	4
-1	1	4	5	2
0	2	4	2	1
1	7	3	0	2
2	0	0	1	2
Totals	4	-1	-9	-4

Based on the straw poll, Approach A was considered the preferred option for further evaluation. A final vote was taken for Approach A, resulting in 2 votes for A1 and 4 votes for A2 (1 vote/community). Therefore, Approach A2 will be considered for further analysis.

4. Looking Forward and Closing

The group was told that the next step would be to evaluate the preferred regional approach (A2) with further specifics discussed at the next meeting. The following will also be discussed at the next meeting on November 26, 2013 (location TBD): understanding revenue needs based on the feedback from the survey and meetings with communities and public outreach & messaging.



Stormwater Stakeholder Group

November 25, 2013 Meeting #2

**Phase I – Upper Narragansett Bay
Regional Stormwater Utility Feasibility Study**

Rhode Island Department of Environmental Management (RIDEM)
235 Promenade Street, Room 300
Providence, RI 02908

Agenda:

- | | |
|-------------------------|--|
| 4:30 p.m. | ARRIVAL, SIGN-IN & LIGHT MEAL |
| 5:00 - 5:10 p.m. | ROAD MAP, SCHEDULE AND KICK-OFF MEETING REVIEW |
| 5:10 - 5:30 p.m. | STEERING COMMITTEE UPDATE <ul style="list-style-type: none">• Common Characteristics & Perspectives |
| 5:30 - 6:30 p.m. | PRELIMINARY REGIONAL APPROACH <ul style="list-style-type: none">• Discussion & Feedback |
| 6:30 - 6:45 p.m. | BREAK |
| 6:45 - 7:45 p.m. | STORMWATER UTILITY OVERVIEW <ul style="list-style-type: none">• User Fee Approach |
| 7:45 - 8:00 p.m. | LOOKING FORWARD |
| 8:00 p.m. | ADJOURN |



**Sustainable Stormwater Solutions Stakeholder Group
Meeting #2
November 25, 2013**

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Meeting Summary

Meeting Date: Monday November 25, 2013
Time: 5:00 p.m. to 8:00 p.m.
Location: RI Department of Environmental Management, Providence, RI
Prepared by: Kevin Gould/James Greiman (Conover + Gould Strategic Communications) Rich Niles/Andy Reese (AMEC)

Attendees:

Stakeholder Group

Mark Van Noppen - Armory Revival Company	Jamie Rhodes - Clean Water Action
Scott Duhamel - Construction and Building Council	Dave Caldwell, Jr. - RI Builders Association
Topher Hamblett - Save the Bay	Jonathan Ford - Blackstone Park Conservatory
Len Bradley - DiPrete Engineering	Marc Petrowicz - RI Nursery & Landscape Foundation
Harold Gadon - Environment Council of RI	Gale Gennaro - Finance and Business Office
Shannon Brawley - RI Nursery & Landscape Assn.	Besuka Kandell - Groundwork Providence
Marcus Mitchell - Mt. Hope Neighborhood Assn.	

Project Team

Andy Reese- AMEC	Prabha Kumar- Black and Veatch
Rich Niles- AMEC	Kevin Gould- Conover + Gould Communications
Jim Riordan- Fuss & O'Neill	James Greiman- Conover +Gould Communications
Elizabeth Scott- RI DEM	

Observers

Meg Kerr - Narragansett Bay Estuary Program	Sheila Dormody - City of Providence
Bill Bombard - City of Providence	

Discussion Topics:

Attached for reference are the meeting agenda and PowerPoint presentation that served as the basis for discussion at Meeting #2.

1. Kick Off Meeting Review

The meeting began with a recap of the first meeting:

- Project goals and objectives
- Road map & next steps



- Hopes and concerns on overall process
- Feedback on compelling issues & voting

2. Steering Committee Update

Members of the Project Team presented information on the common characteristics of stormwater systems that are currently in place within the study area. This information represented a summary from the Steering Committee Meeting #2 on October 29, 2013:

- Current stormwater programs are fairly limited with reactive maintenance, low capital investment and have a poor understanding of actual needs for the collection/conveyance system.
- Infrastructure for storm drain systems is aged, inadequate in places and interconnected with sanitary sewer systems (combined sewer systems).
- Funding issues exist across all communities.

Additional Feedback from the Steering Committee

The Steering Committee expressed a desire to have a region-wide consistent and acceptable level of service. Some of the Steering Committee's concerns amongst communities were related to differing priorities, inequality of current needs and future investment, and fee creep.

The Steering Committee also inquired about the available data for stormwater expenditures and the consequences of doing nothing (e.g., enforcement action). In response to the latter question, Elizabeth Scott responded that if nothing was done to improve stormwater management, there would likely be enforcement action by DEM and/or other entities.

3. Preliminary Regional Approach

Advantages and Disadvantages

The Project Team presented some of the advantages and disadvantages of a regional approach to stormwater management and funding, which are outlined in the presentation slides. Discussion was limited, but some relevant feedback/concerns from the Stakeholder Group are provided below:

- Reluctance to establish another bureaucracy.
- Other examples of regionalization are not great models to follow.
- Varying demographics in the region.

Stakeholder Group Process

The Project Team developed a preliminary regional approach for consideration by the Steering Committee at Meeting #2, which was based on Meeting #1 and other project tasks. The Project Team presented the results of this analysis to inform the Stakeholder Group and solicit feedback. The presentations slides lay out the following information that served as the basis for the analysis: Assumptions; Objective Criteria; Major Program Pieces; and 3 Potential Entities (Local Government, New Regional and NBC). The most favorable of the preliminary regional approaches was presented for discussion. Some of the key questions and comments/concerns are summarized below:



- Not everyone understands the difference between a combined sewer system (CSS) and separate systems for stormwater and sanitary sewer.
- How is this approach more equitable and what does this mean?
- NBC could manage it and it could mirror the way NBC operates.
- Why doesn't DEM manage it? What about a state authority?
- Concerns about creating a new entity and duplicating efforts.
- Odd relationship between NBC and municipalities – NBC may not be the best option.
- NBC currently does some stormwater – why not have them do it?
- NBC doesn't cover the entire service area for stormwater management programs.
- NBC is primarily interested in the conveyance and treatment systems for wastewater and to prevent/control the release of raw sewage.
- Would NBC get a credit for what they are currently doing to manage stormwater?
- Where would new innovation and new ideas fall?
 - Under the MS4 New Regional?
 - NBC cannot take on extra responsibilities.
- It could take as long as 10 years to merge the efforts of the New Entity and NBC.

4. Stormwater Utility Overview

The Project Team presented an overview of: what a stormwater utility actually is; resources, money and revenue; taxes versus user fees; calculating a stormwater user fee; and advantages of a stormwater utility. The following statements, questions and feedback (including voting) were noted by the Project Team during the presentation and discussion:

How does a Stormwater User Fee Work?

- Are people going to try and figure out how to not pay fees? Some will.
- The fees are centered around maintenance of the infrastructure? This is part of it.
- Would there be a different fee if you are involved in different industries? It's an option.
- How is pervious pavement viewed – not charged? Correct.
- How do you qualify for small incremental credit? Does it have to be engineered? Not always, there are numerous credit options and policies that can be considered.
- Are there discounts for existing stormwater management? Yes, credits.
- Seems like a lot of work for a relatively small fee. Would a big portion be for administration and billing? No.
- With such a small fee, are property owners really motivated to make improvements? Depends on the property, impervious area and stormwater infrastructure.
- What other cities are charging enough to incentivize? Philadelphia, Portland, etc are examples
- What about a neighborhood retrofit to reduce fees? Possibly.
- Can there be different fees for different places? Yes, varying levels of service.
- Need to better understand assets/infrastructure to determine needed level of service, which will drive program costs.

Preliminary Analysis of Potential Revenue

The project team presented a preliminary analysis of potential revenue based on a rough estimate of future program costs, an assumed billing unit and the total impervious acres for each community. Current and future program budgets were briefly discussed for each



community based on limited available data. Based on this information, the Stakeholder Group was polled to gauge the following:

- **Stakeholder Willingness to Pay** – the monthly fee per billing unit (ERU or single-family residence) that each Stakeholder would be willing to pay based on the current understanding of stormwater program needs.
- **General Population Willingness to Pay** – the amount that Stakeholders felt the General Population would be willing to pay.

Willingness to Pay (\$/Mo/ERU)	Stakeholders	General Population
1	0	0
2	0	0
3	0	0
4	0	1
5	3	9
6	1	2
7	1	-
8	0	-
9	0	-
10	5	-
15	3	-

The voting indicates that the Stakeholder Group is willing to pay a much higher fee than the perceived willingness of the General Population. Most Stakeholders felt that \$5/month/ERU was the most that the General Population would be willing to pay for stormwater.

Pros and Concerns of a Stormwater User Fee

Each of the Stakeholder Group members were asked to provide their thoughts on the pros and concerns about a stormwater user fee. These are listed below:

User Fee Pros:

- It's a good idea because it cleans the water.
- Can help address flooding.
- Fair to all who reside in the entity's region.
- Everyone pays.
- It forces cooperation that is needed.
- It makes good financial sense.
- It is a landmark project and opportunity to expand to a larger area.
- Good for large metro to take steps toward this, sets example for wider use.
- Larger environmental benefits – triple bottom line.
- Progress towards fixing problems.
- Ability for public education. Provides general education.
- Will result in better planning.
- Will help solve maintenance and infrastructure issues.
- Non-political (sort of).
- Promotes safety.
- Can be a peer City example.
- Hoping it will have a positive ripple effect.



User Fee Concerns:

- Good messaging is needed to sell the project to the public.
- How do we incentivize?
- There are complicated problems to solve.
- Need to establish clear expectations (and immediate benefits).
- Need a compelling case – there are problems!
- Duplication of efforts – another bureaucracy.
- Need a realistic and clear program definition – level of service over time.
- Need an effective PR program.
- Need a more comprehensive plan (program).
- State exemption from paying fees.
- Any new fee is too much – people are tapped out on existing fees.
- Where are the new techniques, innovations, and incentives?
- The project is years down the road and progress is needed.

Comfort Level: User Fee versus Tax Increase

The Stakeholder Group members were asked to gauge their comfort level funding the stormwater program through a fee versus a tax increase. The voting is summarized below:

Comfort Level for User Fee: (1) No User Fee; (5) Strongly Support a User Fee	Votes
1 (Strong No)	0
2 (Don't Like It)	0
3 (Neutral)	0
4 (Best Among Options)	2
5 (Strong Support)	11
6 (Do Nothing Now)	0

Should We Continue to Explore this Approach?

The Stakeholder Group members were asked to gauge their comfort level to continue exploring a regional approach with a stormwater user fee. The voting is summarized below:

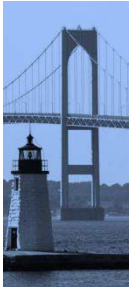
Continue w/Regional User Fee Approach	Votes*
1 (Strong No)	0
2 (Don't Like It)	0
3 (Neutral)	0
4 (Best Among Options)	1
5 (Strong Support)	11
6 (Other/ No Vote)	0

*one member left early.

The majority of the Stakeholder Group members strongly supported the continued exploration of a regional approach for stormwater management with funding through a user fee versus tax revenue.

5. Looking Forward

No significant comments or discussion.



Sustainable Stormwater Solutions Steering Committee

November 26, 2013 Meeting #3

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Narragansett Bay Commission
1 Service Road
Providence, RI 02905

Agenda:

- | | |
|---------------------------|--|
| 8:30 a.m. | ARRIVAL, SIGN-IN & SNACK |
| 9:00 - 9:10 a.m. | ROAD MAP, SCHEDULE AND MEETING #2 REVIEW |
| 9:10 - 9:20 a.m. | STAKEHOLDER GROUP MEETING #2 UPDATE |
| 9:20 - 10:45 a.m. | REGIONAL APPROACHES <ul style="list-style-type: none">• Partners• Program elements• Activity |
| 10:45 - 11:00 a.m. | BREAK |
| 11:00 - 11:45 a.m. | FUNDING APPROACHES <ul style="list-style-type: none">• Stormwater user fee approach• Preliminary revenue analysis• Legal considerations |
| 11:45 - 12:00 noon | LOOKING FORWARD <ul style="list-style-type: none">• Recommendations for further study• Draft Phase I Feasibility Report |
| 12:00 noon | ADJOURN |



**Sustainable Stormwater Solutions Steering Committee
November 26, 2013 Meeting #3**

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Meeting Summary

Meeting Date: Tuesday November 26, 2013
Time: 9:00 a.m. to 12:00 p.m.
Location: Narragansett Bay Commission, Providence, RI
Prepared by: Kevin Gould/James Greiman (Conover + Gould Strategic Communications) Rich Niles/Andy Reese (AMEC)

Attendees:

Steering Committee

Bill Bombard - City of Providence
Dave Everett - City of Providence
Eric Earls - City of Warwick
Eric Hindinger - City of Warwick
Erik Skadberg - City of East Providence
Andrew Silva - City of Pawtucket

Mary Twohey - City of Central Falls
Elaine Partridge - City of Central Falls
Ken Mason - City of Cranston
Edward Tally - City of Cranston
Ray Marshall - Narragansett Bay Commission
Tom Uva - Narragansett Bay Commission

Project Team

Andy Reese - AMEC
Rich Niles - AMEC
Jim Riordan - Fuss & O'Neill
Elizabeth Scott - RI DEM

Prabha Kumar - Black and Veatch
Kevin Gould - C+G Strategic Communications
James Greiman - C+G Strategic Communications

Observers

Meg Kerr - Narragansett Bay Estuary Program Sheila Dormody - City of Providence

Discussion Topics:

Attached for reference are the meeting agenda and PowerPoint presentation that served as the basis for discussion at Meeting #3.

1. Road Map, Schedule and Meeting #2 Review

Review of Project Road Map: no significant comments or discussion.

Program Review Perspectives: the following is a summary of the general discussion related to the current stormwater programs and information/feedback collected by the Project Team.

- Stormwater systems are generally in poor condition. Communities don't have money and, if they did, stormwater projects would not be at the top of the list.



- Low level of program investment and average to poor condition of current stormwater assets are some of the biggest road blocks of the existing programs.
- Municipalities face various economic challenges and have a wide range in level of service.
- The regulatory requirements are going to increase. It's only going to get more difficult if nothing is done.
- Typically, improvements are not made until something goes wrong because you can't see it. Right after a big flood or when beaches are closed is when people start paying attention.
- We have to make a dispassionate decision about what to do. That's why we're here. If we don't address it now, then we are just delaying the issue.
- The best approach would be to do something before a crisis or a regulator tells us we have to do it.

NBC Thoughts on Meeting #2

Ray Marshall was not able to attend Meeting #2 and Tom Uva had to leave early. The Project Team reviewed the preliminary regional approach with Ray and Tom prior to Meeting #3 and wanted to give NBC an opportunity to provide their feedback during the meeting. Some of this information is summarized below:

- NBC proposed to conduct a study and report about the organization potentially taking over community wastewater collection systems through state legislature.
 - NBC did not want to force communities into this model if they didn't want to participate. They decided to go forward with the plan internally. A legislative proposal was introduced but did not pass in the senate.
- NBC Board of Directors does not want to do billing for another entity.
 - Doesn't want to be labeled as trying to impose new fees on the community, and therefore, has no interest in taking on those duties.
 - Although there may be efficiencies through integration of administrative functions and customer service, the NBC service area does not include all communities.
 - NBC's current position is that they don't want to take on billing for a regional stormwater entity. The two biggest hurdles to change that position are the NBC Board of Directors and the Public Utilities Commission (PUC). There are other entities that serve more people that might be willing to do billing.
 - NBC is regulated by the PUC so everything that appears on their bill has to be approved by them.
- Question: Would a new regional system fall under the PUC?
 - Not necessarily, NBC is under the PUC because that requirement was part of the original legislation under which they were created.
 - The statute that allows for a regional stormwater entity doesn't mention the need for PUC involvement.



2. Stakeholder Group Meeting #2 Feedback

A summary of the feedback from the Stakeholder Group Meeting #2 was presented to the Steering Committee with the following key points:

- Recognition of NBC's responsibilities for the combined sewer system and the challenges that local municipalities face to manage stormwater infrastructure.
- The group recognized that a regional entity was the best choice at the moment.
- Looked to future for regional entity handling all "water" resources.

The following feedback was noted:

- NBC had talked with communities about combining wastewater into one entity.
 - Communities were against it due to the fear of losing control.
 - Everyone needs to be all in for this program to get off the ground and be successful.

3. Regional Approaches

The Project Team presented the advantages of a regional approach and the current budget estimates for stormwater programs in each community based on available information. The following comments were noted:

- A regional entity could also eliminate bureaucracy, allow greater access to sources of specialized expertise, direct projects within watersheds, spread costs across a larger payer base, and have a greater chance for outside funding.
- Regional organizations would benefit from grant programs that provide up to 75% of the project cost. Individual towns cannot come up with the 25% match, which prevents the towns from leveraging grants.

What would a Regional Entity do? Steering Committee members were given 2 votes for their top priorities and the results are tallied below.

Top Duties for "New" Regional Entity	Votes (2/person)
1. Construction & Engineering	8
2. MS4 Collection System Operator	8
3. Compliance Manager	3
4. Floodplain Manager	1
5. Regulator and Inspector	1
6. Watershed Manager	0
7. Development Partner	0
8. Public Educator	0
9. Information Manager	3
10. Finance and Administration	0

Relevant Comments:

- This project will not be implemented overnight, it takes time.



- Other regional programs have taken about 20 years to catch up.
- The “Regional Entity” needs a name.

Likes about the Regional Approach

- Watershed wide approach.
- Consistency of funding.
- Municipalities could move stormwater off their plate.
- Consistency of services and solutions.
- Only way problem will be addressed (current approach isn’t working).
- Consistent regulation/enforcement and inspection.
- Expertise in fixing problems.
- Project consistency.

Dislikes about the Regional Approach

- Loss of control over system.
- Cities will not be accountable for stormwater issues.
- Cost is going to be significant – the entire project costs are significantly underestimated.
- Fee creep.
- Public perception of a “rain tax”.
- Unforeseen challenges (e.g., lawsuits, costs).
- Concerns about fair play and municipal priorities.

4. Funding Approaches

The project team presented a preliminary analysis of potential revenue based on a rough estimate of future program costs, an assumed billing unit and the total impervious acres for each community. Current and future program budgets were briefly discussed for each community based on limited available data. Based on this information, the Steering Committee was polled to gauge the following:

- **Steering Committee Willingness to Pay** – the monthly fee per billing unit (ERU or single-family residence) that each Steering Committee member would be willing to pay based on the current understanding of stormwater program needs.
- **General Population Willingness to Pay** – the amount that Steering Committee members felt the General Population would be willing to pay.

Willingness to Pay (\$/Mo/ERU)	SC Members	General Population
0	0	2
1	0	1
2	0	1
3	0	1
4	3	4
5	1	2
6	0	1
7	1	-



Willingness to Pay (\$/Mo/ERU)	SC Members	General Population
8	2	-
9	0	-
10	2	-
20	1	-

The voting indicates that some of the Steering Committee members are willing to pay a much higher fee than the perceived willingness of the General Population. Most felt that \$4/month/ERU was the most that the General Population would be willing to pay for stormwater.

Other Comments Noted:

- Program needs and costs are preliminary and will likely increase over time.
 - We need to go out and actually develop reliable financial estimates instead of just throwing out a number – doing this will lead to confusion.
 - Will we be able to control the cost? Will \$4/month/ERU get it done?
 - Concerns about why there are no detailed numbers or analysis. Study is preliminary and this needs to be explored further – the intent was to gauge interest in further analysis of the concept.
- Are there examples of failed stormwater utilities?
 - There are more hidden fees that have not been accounted for yet. This will be accounted once the program is further developed, including a cash flow model.
 - Communities that have lower incomes may not need to worry about stormwater because they have a combined system.
 - It must be imperative to figure out the real cost of this effort into the future. These concerns need to be understood and addressed to continue the project.
- Review of User Fee Pros and Cons from stakeholder meeting:
 - Is it realistic to solve problems in such a short period of time? Not all problems.
 - Do stormwater entities do their own work or do they contract out? Can vary.

Comfort Level: User Fee versus Tax Increase

The Steering Committee members were asked to gauge their comfort level with funding the stormwater program through a fee versus a tax increase. The voting is summarized below:

Comfort Level for User Fee: (1) No User Fee; (5) Strongly Support a User Fee	Votes
1 (Strong No)	0
2 (Don't Like It)	1
3 (Neutral)	1
4 (Best Among Options)	6
5 (Strong Support)	4
6 (Do Nothing Now)	0



Related Comments:

- Is there a board or entity that people can turn to if something goes wrong? There will be.
- The NBC is constantly caught in the middle of debates on stormwater and sanitary sewer control. This will have to be sorted out with a clear process/responsibilities.

Should We Continue to Explore this Approach?

The Steering Committee members were asked to gauge their comfort level to continue exploring a regional approach with a stormwater user fee. The voting is summarized below:

Continue w/Regional User Fee Approach	Votes
1 (Strong No)	0
2 (Don't Like It)	2
3 (Neutral)	3
4 (Best Among Options)	5
5 (Strong Support)	2
6 (Other/ No Vote)	0

In general, the majority of the Steering Committee members were neutral or felt that a regional approach for stormwater management with funding through a user fee versus tax revenue was the best approach among the available options.

Review of Stakeholder Group Voting:

The voting results from the Stakeholder Group Meeting #2 were presented to the Steering Committee and the following comments were noted:

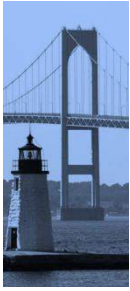
- Who was in the Stakeholder Group last night?
 - Majority of stakeholders indicated that they were interested in making this project happen.
 - Stakeholders are looking out for their interests and the Steering Committee is looking out for tax payers.
- We are taking the costs that would be the responsibility of the tax payers and redistributing it.

Overview of RI Authority for Stormwater Utilities

- State property exemption in the 2002 Stormwater Management and Utility Act is a significant issue that needs to be addressed moving forward.

5. Looking Forward

No significant comments or discussion.



Sustainable Stormwater Solutions Steering Committee

February 6, 2013 Meeting #4

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Narragansett Bay Commission
1 Service Road
Providence, RI 02905

Agenda:

- 8:30 a.m. ARRIVAL, SIGN-IN & SNACK**
- 9:00 – 10:30 a.m. FEASIBILITY STUDY RESULTS**
- Chronological walk through
 - Key results, findings and recommendations
 - Comment and discussion on findings/recommendations
 - Overview of roadmap
 - Overview of report outline
- 10:30 - 10:45 a.m. BREAK**
- 10:45 - 11:00 a.m. COASTAL RESILIENCY GRANT FOR PHASE II**
- Schedule & discussion with the grant
- 11:00 - 11:45 a.m. FUTURE PLANNING DISCUSSION**
- Roll out of Communication
 - Elected / Administration
 - Dept heads
 - How do we do this without the grant - \$150k
 - Community support
 - Discrete steps – 2 steps?
 - Opportunities for collaboration
 - Other things that may have value
 - Catch basin cleaning – how do it together
- 11:45 a.m. ADJOURN**



**Sustainable Stormwater Solutions Steering Committee
February 6, 2014 Meeting #4**

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Meeting Summary

Meeting Date: Thursday February 6, 2014
Time: 9:00 a.m. to 12:00 p.m.
Location: Narragansett Bay Commission, Providence, RI
Prepared by: Kevin Gould/James Greiman (Conover + Gould Strategic Communications) Rich Niles/Andy Reese (AMEC)

Attendees:

Steering Committee

Bill Bombard - City of Providence
Dave Everett - City of Providence
Eric Hindinger - City of Warwick
Ken Mason - City of Cranston
Elaine Partridge - Central Falls
Erik Skadberg - City of East Providence
Peter Healey - RIDOT

Emilie Holland - RIDOT
Eric Earls - City of Warwick
Andrew Silva - City of Pawtucket
Edward Tally - City of Cranston
Tom Uva - Narragansett Bay Commission
Ray Marshall - Narragansett Bay Commission

Project Team

Andy Reese - AMEC
Rich Niles - AMEC
Jim Riordan - Fuss & O'Neill
Elizabeth Scott - RI DEM

Prabha Kumar - Black and Veatch
Kevin Gould - C+G Strategic Communications
James Greiman - C+G Strategic Communications

Observers

Meg Kerr - Narragansett Bay Estuary Program
Topher Hamblett - Save the Bay
Sheila Dormody - City of Providence

Discussion Topics:

Attached for reference are the meeting agenda and PowerPoint presentation that served as the basis for the meeting and discussion for Meeting #4. Topics are outlined below according to the presentation with information relevant to the discussion or comments during the meeting.

1. Feasibility Study Recap

Meeting #1 (9/25/14): the following is a summary of the general discussion related to Compelling Reasons for Change (slide #9) – review of votes for the biggest needs for the region and stormwater program.



- Steering Committee: it's surprising that "compliance" only got one vote.
- Project Team: compliance is a catalyst for why everyone is here. A solid stormwater program to address infrastructure and water quality will generally result in regulatory compliance.
- Steering Committee: flooding is the biggest issue that is present in Cranston.
- Project Team: Messaging is focused on three major issues (flooding, infrastructure, and water Quality).

Meeting #2 (10/29/13): the following is a summary of the comments and general discussion related to the recap of Meeting #2.

- Local Programs and Reaction (slide #12)
 - Steering Committee: affordability is a significant concern.
- Consideration of Regional Approaches (slide #18)
 - Project Team: this is all still a concept.
 - Steering Committee: what would be the result of a "do nothing" approach?
 - Project Team: if nothing is done, there is a high likelihood that a catastrophe will eventually occur that will be more expensive and could have legal ramifications.
 - Project Team: economies of scale will keep cost even throughout the program implementation.
 - Project Team: it is difficult to convey to people the need for a new stormwater system. Everyone should think about their own municipality's issues and think about how a regional approach can help solve them.

Meeting #3 (11/26/13): the following is a summary of the comments and general discussion related to the recap of Meeting #3.

- Preliminary Analysis of Potential Revenue and Consideration of Funding Approach (slides #24 & #25)
 - Project Team: for \$4/month/ERU, you can have a pretty good start for the stormwater program.
 - Steering Committee: can you remind us what does the ERU represents and how was it derived?
 - Project Team: the equivalent residential unit (ERU) is the median square footage of impervious area on a single-family property. It is typically used as the billing unit for a stormwater utility. For this project, a typical ERU of 2,500 sf was assumed and the total number of ERUs (billing units) was derived using the state-wide impervious cover GIS data layer and parcels for each community, irrespective of land use (since land use coding information was not available in GIS to distinguish between residential and non-residential properties).
 - Steering Committee: did you go back and look at the data to confirm that the cost would be in the ballpark?
 - Project Team: program costs are based on data provided by each of the communities with an estimate of future needs, but this data does not appear to capture all costs and needs. This is a high level estimate that needs to be refined through further study and the current costs are presented as a point of comparison to the revenue potential based on a gross estimate of billing units.
 - Project Team: there are many factors that go into calculating the rate structure, billing units (e.g., ERUs) and resulting fee based on a defined level of service for the stormwater program. Parcel and land use data across the study communities varied significantly and the project team can only provide gross estimates of billing units and revenue.



- Support for Next Steps (slide #26)
 - Steering Committee: it needs to be done, but we need a realistic number. There needs to be a dialogue with other stormwater managers who work with this proposed system (program) so they can give their input.
 - Project Team: from a permitting standpoint to address requirements such as TMDLs, Rhode Island's stormwater management program is less mature than other states. Future requirements for capital construction to address TMDLs could drive the stormwater program cost much higher, but the program won't move forward from 0-60 mph and it will take time to develop.
 - Steering Committee: we are concerned that the fee will jump if we don't accurately assess needs and project costs upfront. Municipalities and citizens will feel misled.
 - Steering Committee: the program needs to be affordable, utilize an integrated approach, and push back schedules for compliance. This is a new permit process so there will be changes over time.
 - Project Team: one of the biggest drivers for cost is large projects such as flood mitigation, not MS4 permits.
 - Steering Committee: a recent example was discussed and how permitting requirements drove project costs up significantly.
 - Project Team: generally across the spectrum, projects don't go crazy in terms of cost, it's all spread out. \$4/mo/ERU can fix specific problems, but everyone needs to come back with their own municipality's problems.
 - Steering Committee: we will not be able to forecast the cost until all program elements are thoroughly reviewed.

2. Recommended Roadmap

The following is a summary of the comments related to the Recommended Roadmap. The Steering Committee members were provided the road map via e-mail on January 30, 2014 as part of the Coastal Resiliency Grant that was submitted for Phase II of the project.

- Overview of Roadmap (slides #35-37)
 - Project Team: everything needs to be done in this phase to avoid legal issues in Phase II. Think of Phase II as the development of a stormwater business plan. \

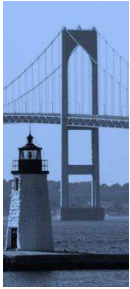
3. Looking Ahead to the Next Phase

The following is a summary of the comments and discussion related to the Coastal Resiliency Grant, communication strategy and next steps for Phase II of the study.

- Coastal Resiliency Grant (slides #38 & 39): no significant discussion or questions.
- Communication Strategy (slide #42): discussion.
 - Project Team: feasibility studies have been conducted in this manner before. Good communication is important at this level because this is a process and everyone needs to be on the same page. It is important to communicate appropriately with the general public about the project.
 - Steering Committee: this feasibility study is on the docket in Cranston currently, and we would be willing to share results.
 - Steering Committee: roll out to at municipal department head meetings in April 2014. First contact should be with key city administrative staff before the



- regional approach is presented to the city council or elected boards in a public meeting forum.
- Project Team: RIDEM is available to assist with communicating the initial feasibility study and next steps with municipal department staff.
 - How do we do this without the NFWF grant? Discussion of the suggested “Two-Step Approach” (slides #44 & 45):
 - Steering Committee: NBC will share data and materials from their own projects.
 - Steering Committee: will you inspect the current infrastructure to know how much work our system would need.
 - Project Team: that is what the Phase II assessment is for, to look at these issues.
 - Steering Committee: you need to be sure that if you do not receive that grant, you will still be able cover all of your needs. Do not lose sight of the base money.
 - Opportunities for Collaboration (slide #47): no significant discussion or feedback.
 - Regional Economy of Scale (slide #48): review of catch basin cleaning example.
 - Steering Committee: many of us clean using our own equipment so at this time we would not contract regionally to do the cleaning.
 - Project Team: this was an example of potential regional savings for a consolidated maintenance activity. Regionalization of this activity may be more viable if communities needed to enhance their cleaning program to annually clean 50% or more of catch basins, for example.
 - Project Team: Waterfire Providence is concerned about the amount of sediment that is flowing into the WaterPlace Park basin. Road runoff is a large contributor and it will take a collaborative effort to address this issue.



Stormwater Stakeholder Group

February 25, 2014 Meeting #3

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Rhode Island Department of Environmental Management (RIDEM)
235 Promenade Street, Room 300
Providence, RI 02908

Agenda:

- | | |
|-------------------------|---|
| 4:30 p.m. | ARRIVAL, SIGN-IN & LIGHT MEAL |
| 5:00 - 6:00 p.m. | FEASIBILITY STUDY RESULTS <ul style="list-style-type: none">• Key results, findings and recommendations• Comment and discussion on findings/recommendations• Overview of report outline |
| 6:00 - 6:15 p.m. | RECOMMENDED ROADMAP & COASTAL RESILIENCY GRANT FOR PHASE II <ul style="list-style-type: none">• Schedule & discussion |
| 6:15 - 6:30 p.m. | BREAK |
| 6:30 - 7:45 p.m. | FUTURE PLANNING DISCUSSION <ul style="list-style-type: none">• General feedback• Stakeholder participation and future role in Phase II• Elements in communication going forward• Cautions or advice |
| 7:45 p.m. | ADJOURN |



**Sustainable Stormwater Solutions Stakeholder Group
February 25, 2014 Meeting #3**

Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

Meeting Summary

Meeting Date: Tuesday, February 25, 2014
Time: 5:00 p.m. to 8:00 p.m.
Location: RI Department of Environmental Management, Providence, RI
Prepared by: Kevin Gould/James Greiman (Conover + Gould Strategic Communications), Rich Niles (AMEC)

Attendees:

Stakeholder Group

Mark Van Noppen - Armory Revival Company	Jamie Rhodes - Clean Water Action
Topher Hamblett - Save the Bay	Dave Caldwell, Jr. - RI Builders Association
Len Bradley - DiPrete Engineering	Harold Gadon - Environment Council of RI
Marc Petrowicz - RI Nursery & Landscape Found.	John Sinnott - Gilbane Building Company
Shannon Brawley - RI Nursery & Landscape Assn.	Gale Gennaro - Providence College, Office of EHS
Beshka Kendell - Groundwork Providence	Bob Vanderslice - Brown University
Marcus Mitchell - Mt. Hope Neighborhood Assn.	Meggie Patton - Brown University
Scott Duhamel - Construction and Building Council	

Project Team

Rich Niles - AMEC	Kevin Gould - Conover + Gould
James Greiman - Conover +Gould	Elizabeth Scott - RI DEM

Observers

Sheila Dormody - City of Providence	Bill Bombard - City of Providence
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Discussion Topics:

Attached for reference are the meeting agenda and PowerPoint presentation that served as the basis for the meeting and discussion for Meeting #4. Topics are outlined below according to the presentation with information relevant to the discussion or comments during the meeting.

1. Feasibility Study Results – Findings & Recommendations

Part 1: Program Needs and Concerns:

- Stakeholder Group: Go/No go study? What does that mean?
- Project Team: project does not move forward without general consensus from municipalities.



- **Review of key issues, feedback and voting at previous meetings (slides #6 & 7)**
 - Observer: explained to group who makes up the steering committee and their role thus far in the project.
 - Project Team: the contrast in voting between the Stakeholder Group and Steering Committee was noted in the case of “policy” issues where it received 29 votes by Stakeholder Group members and 11 by Steering Committee members.
 - Stakeholder Group: what does “policy” mean (encompass)?
 - Project Team: based on the information provided by the Stakeholder Group at Meeting #1, the following were incorporated into the “policy” category:
 - Zoning and other hurdles
 - Connect infrastructure with land use
 - Incentives
 - Enforce rules we have – variances
 - Ease of access
 - Inconsistent criteria
 - Uncontrolled infill
 - One stop for everything water

Part 2: Stormwater Utility and Regional Solution Options

- **Discussion of Comfort Level: User Fee Versus Task Increase (slide #15)**
 - Stakeholder Group: whether we call it a tax or a fee, will the funds be given to a new entity?
 - Project Team: yes, under a regional approach. The rate structure and level of service may vary from municipality to municipality, so the program and related fee will vary to be fair and equitable.
 - Stakeholder Group: it seems like it would be easier if the fee collected through the property tax in each municipality.
 - Project Team: municipalities would have to be more involved in the billing process for the stormwater fee. Not all properties that receive a tax bill will receive a stormwater bill and vice versa. The approach for billing needs further evaluation as part of the next steps for a regional stormwater utility.
- **Overall Perspectives on “Region” (slide #21)**
 - Stakeholder Group: will insurance rates be cut due to better management?
 - Project Team: we don’t know.
- **Program Funding and Future Needs (slide #25)**
 - Stakeholder Group: what does \$11 million pay for?
 - Project Team: this is a “rule of thumb” value that represents a moderate level of service for a stormwater program in typical communities across the nation. In other words, communities with a moderate level of service for their stormwater program typically spend about \$175 per developed acre of land per year. This is about 2-3 times the current level of service, but it does not represent the actual needs since there was insufficient data during the initial feasibility study. In general, this “moderate” level of service does not pay for large capital projects.

2. Phase II Recommended Roadmap

- **Coastal Resiliency Grant (slide #37)**
 - Project Team: all municipalities have agreed to support the project. Phase II is a more comprehensive scope to address needs identified under Phase I and implement the recommended roadmap. Phase II includes hydrologic modeling of



priority drainage catchments and hydraulic modeling of the storm drain system in the context of climate change issues such as extreme precipitation events and sea level rise.

- Stakeholder Group: will the modeling related to climate change and coastal resiliency include other aspects of environmental impact?
- Project Team: the modeling is specific to the storm drain system but it will incorporate information and research (e.g., rising sea levels) from other organizations, such as the URI Coastal Research Center. This is not a climate change assessment project but we will evaluate impacts to the storm drain infrastructure based on certain climate change phenomena.
- Stakeholder Group: is this being done because of federal mandates?
- Project Team: “status quo” is just not enough despite who tells you what to do - federal mandates are not the primary reason for the Phase II study.

3. Future Planning and Discussion

• Quick Reflection (slide #41)

- The Project Team summarized the following key themes from the Stakeholder Group’s discussion of: 1) What resonates most to you based on what you’ve heard so far? and 2) What are the most meaningful results of this preliminary feasibility study?

- **Regional Concept is Needed**
- **Education is Key** (*lack of understanding, “how to best solve”*)
- **Need Good Data/Program**
- **Emphasize Infrastructure Needs**
- **Regional Entity Needs to be an Effective Problem Solver**
- **Defined and Dedicated Resources/Responsibilities**
- **Different Concept – Must Sell Well**
- **Need a Strong Compelling Case** (*and consequence*)

Some of these key themes are embedded in the discussion below as it occurred during the meeting. These key themes also serve as the key messages that the Stakeholder Group felt should be conveyed to others.

- Stakeholder Group:
 - Regional approach could create a template for the rest of the state for a wide variety of services (e.g., education, emergency management, DPW).
 - Field data is essential to making this program successful in the future.
 - Education is key to the success of the program. We need to start the education process as soon as possible because no one understands stormwater.
 - “Average Joe” won’t respond to water quality messages, but will understand the serious issues and the fact that ignoring the problem will not make it go away.
- Project Team:
 - Real problems and real solutions exist and this program is the best option for all parties involved.
 - There need to be economies of scale and efficiencies in problem solving to garner full support of a regional approach.



- Stakeholder Group:
 - Responses to the program will be better when using a concise and “clean” argument.
 - It is important to identify who will maintain the system once it is put in place and how it will be maintained.
 - A definitive program in place is good but it will have to be sold and it is very different than any previous program. The public is very skeptical of any new government entities.
 - Proposed revenue is marginal to other programs, how will anything be accomplished?
- Project Team:
 - The full cost to fix all of the problems is likely a big number. It cannot all be done at once, but we need to begin addressing obvious problems, build the program, gain a greater understanding of the system, and prioritize activities.
- **Participation (slide #43)**
 - Level of involvement for current Stakeholder Group:
 - In general there was strong support to continue a similar engagement process for the Stakeholder Group under Phase II.
 - Discussion of other groups that should be involved:
 - Providence Foundation – did a study for dredging WaterPlace Park.
 - Chamber of Commerce
 - City/town councils and municipal officials
 - Local Emergency Planning Committees (LEPCs)
 - Project Team:
 - There are many policy questions to be asked (e.g., regional governance & organization structure) and some groups may not get involved until some of those questions are answered.
- **Messaging (slide #44)**
 - The Project Team summarized the following key themes from the Stakeholder Group’s discussion of: 1) Based on what you know now . . . What is your primary “take home message” to convey to others? and 2) How does it change for various audiences?
 - **Community Leadership & Elected Officials**
 - *Need to see overall concept/structure*
 - *Focus on key issues and solutions for each community*
 - *Be clear about what it will pay for*
 - **General Public**
 - *Need to know why, not the details of how to do it*
 - *Message must be short and sweet*

The above messages focus more on the types of information and approach for different audiences and the results of the “quick reflection” seem to more accurately characterize the Stakeholder Group’s “take home messages”. This information is also embedded in the discussion below as it occurred during the meeting, along with additional relevant discussion of the project.

- Stakeholder Group:
 - Six communities need to agree on this so tailoring the education component is important.
 - Messaging needs to be tweaked from audience to audience.



- Stakeholder Group:
 - Save the Bay is willing to lend support in education/outreach efforts.
 - The environmental community is behind the plan for next steps and wishes it could happen faster.
 - Information about the project could be presented at local U.S. Green Building Council meetings.
- Project Team: in next few months there will be meetings with department heads and town/city councils in each community. We are soliciting assistance from the Stakeholder Group to help us with conversations at the local level in advance of these meetings? The intent is to identify problems that a regional approach will address (community-specific) in order to reduce public resistance to the concept.
- Stakeholder Group: this is a daunting task and there needs to be a very polished marketing campaign. Before it goes public, we need to answer a lot of the potential questions and we need to pull together all affected stakeholders (fishermen, NGOs, town planners, DPW, Emergency Mgmt, etc).
- Project Team: at this point, we are just looking for permission to go to Phase II.
- Stakeholder Group: we need a professional public relation (PR) consultant to help frame and polish the messages and approach.
- Stakeholder Group: poor stormwater management is linked to serious issues (floods, West Nile, beach closures, future costs).
- Project Team: there will be an outreach plan and strategy in Phase II.
- Stakeholder Group:
 - Stormwater regulations have been forced upon new development and it hasn't fixed the problems. If builders think it will make development projects easier, they will support the project.
 - We need to emphasize: What are we paying for? And what are we not paying for?
 - Are there opportunities for public/private partnerships for this?
 - There is a new pot of money in a new EPA program, so there may be money available to support some efforts.
 - The communities have all signed letters saying they are agreeing to move to Phase II, but there is no risk to them. They will get good data at the end and can back out at any time.
 - It takes money to make money. If we have a steady revenue stream we can get other grants and matches.
- The Stakeholder Group discussed examples of public/private partnerships (P-3) for a variety of services and how it could be applied to an enhanced stormwater program to incentivize projects. This approach could accelerate the ramp up of the program and advance green space projects too.

4. Next Steps (slide #45) – no significant discussion.

Appendix V

Municipal Stormwater Program Survey (template)



Memorandum

To: Steering Committee Members in Participating Communities: Central Falls, Cranston, Narragansett Bay Commission, Pawtucket, Providence, East Providence & North Providence **Date: September 29, 2013**

From: AMEC Project Staff & Team Members (Black & Veatch and Fuss & O'Neill)

Subject: Survey/Questionnaire for Analysis of Local Stormwater Programs, Phase I – Upper Narragansett Bay Regional Stormwater Utility Feasibility Study

The intent of this request is to work with you to quickly and effectively digest a large amount of information on the following categories of information and data:

1. municipality overview and land use;
2. stormwater infrastructure;
3. stormwater program, manpower and budget;
4. funding sources;
5. available databases; and,
6. community perspectives and needs

This information will have various uses including estimation of overall program needs, revenue generating potential, key program focuses, comparative information, etc.

We request that you gather the right information to be able to provide responses to this survey/questionnaire in advance of your 1-on-1 meeting with members of the Project Team. The purpose of the 1-on-1 meeting is to review the information gathered to date and address any gaps or provide further clarification of the information requested.

As some of you are aware, a recent data collection effort began through the efforts of the Bi-State Municipal Stormwater Coordinator and we intend to build upon this effort and gather additional information.

Please be ready to provide information in digital or hard copy form, URL links, or in another form for easy review and analysis.

NAME OF MUNICIPALITY: _____

Please provide answers on a separate sheet of paper listing documents of files provided as well as separate answers to questions as appropriate.

1) OVERVIEW OF MUNICIPALITY AND LAND USE

1-1 General Information

- Governance structure (i.e. council, mayor, etc.)
- Organization chart of local staff (can focus only on those related to all aspects of stormwater and pollution, development services, etc.)
- Describe the current economic condition and any recent events of note.
- What are the key industries or specific large companies?
- Are there other recent events or initiatives that may impact on the effort?

1-2 Land Use Information

Please provide available information on land use by type or category (e.g. percent residential, industrial, commercial, agricultural, park and green space, roadway). The total of all categories should equal the area of the municipality.

Alternately provide parcel information in GIS/Metadata and/or database format sufficient for us to derive the categories above.

Suggested Reference Documents: Stormwater Management Plan

2) STORMWATER INFRASTRUCTURE

2-1 Description/Characterization of the System

- Describe your system condition, age, serviceability, etc. Provide system maps or other data and information. Describe how much is served by piped system versus ditches. How much of the service area is separate stormwater system (MS4) and how much is combined sewer system (CSS).

2-2 Statistical or Inventory Information

- Provide available statistical or inventory information on your municipal separate stormwater infrastructure (MS4) and combined sewer system (CSS) including such things as:
 - Miles of drain lines, pipe, ditches, etc.
 - Road miles
 - Number of catch basins, inlets, outfalls, BMPs, detention ponds, etc.
 - % of service area that is MS4 versus CSS
- Provide available or estimated capital and maintenance backlog information. This can be derived from an inventory, asset management program, sample inventory with extrapolation, complaint files, etc. Explain how the information was developed, estimated accuracy, etc.

Suggested Reference Documents: Stormwater Management Plan & Annual Reports

3) **STORMWATER PROGRAM, MANPOWER AND BUDGET**

3-1 Current Stormwater Program Level of Service (LOS) and Costs

Provide additional information about your current stormwater program that is not already available through MS4 annual reports. We are trying to describe all of the services that are currently provided as part of the stormwater program and organize them by the following major categories:

- Administration
- Engineering and Master Planning
- Operations and Maintenance
- Regulation/Enforcement
- Capital Improvements
- Stormwater Quality

Using the attached spreadsheet, populate the categories on the “Existing Costs” tab that apply to your community or change subcategory descriptions to match current activities. DO NOT DELETE ROWS, as this will change the “Summary” tab. Many subcategories are provided as examples of what may be considered a stormwater related activity in your community.

Costs should capture the annual average costs for direct and indirect expenditures for personnel, equipment, expenses and capital. Full burdened labor rates can be applied with effort as a % of annual salary.

3-2 Future Stormwater Program LOS and Costs

Using the same spreadsheet referenced above, estimate the anticipated future stormwater costs for the next 5 years and populate the “Future Costs” tab. Examples may include planned capital projects, equipment purchases, drainage system rehabilitation, MS4 permit compliance (six minimum measure requirements), TMDL or impaired waters planning and implementation (non-structural and structural). If your service area involves CSS mitigation activities and those costs are known, please identify those costs separately. Increases in effort may be based on actual known costs or an estimated % increase in effort (e.g., sweeping twice as often).

The Project Team will assist in developing costs for future MS4 permit, any potential allocation of a portion of CSS costs to the stormwater program, if applicable, and TMDL compliance using related project experience and studies. Unless municipal-specific information is available, the following assumptions will be used to estimate the future costs to begin implementation of the TMDL/impaired waters restoration capital improvement program: for one priority watershed, plan and design a minimum of 6 BMPs and construct a minimum of two BMPs within the next five year period (ending 2019).

3-3 Personnel

List the departments and staff with stormwater management responsibilities on a separate sheet. Examples:

- Highway Foreman – oversee storm drain system repairs, operation and maintenance
- Engineering Department – MS4 permit compliance, monitoring, BMP retrofit designs
- 3 Full-time Equipment Operators – street sweeping & catch basin cleaning
- Town Planner – floodplain management, stormwater permit & plan reviews

Suggested Reference Documents: Annual budgets and capital improvement plans, TMDL implementation plans, stormwater infrastructure improvement plans, and watershed studies.

4) **FUNDING SOURCES**

We would like to gather any readily available data on all of your existing funding sources that you currently utilize to finance your stormwater program. To the extent feasible, please list all funding sources, including any tax revenues that are dedicated to stormwater, and the amount of estimated annual funding from each source.

The following data is desired:

4-1 Operations & Maintenance Funding:

- Permit and Plan Review Fees
- Inspection Fees
- Any Dedicated Sales Tax Revenues
- Any Dedicated Property Tax Revenues
- Any Special District Assessments
- In-kind Resources (from other agencies)
- Other

4-2 Capital Improvements Funding:

- Bonds / Loans
- Developer Contribution
- Federal / State Grants
- Special District Assessments
- Dedicated Sales Tax Revenues
- Dedicated Property Tax Revenues
- Other

5) **AVAILABLE DATABASES**

We want to examine the available data to determine what exists and what may be needed to support stormwater fee development and billing. We also need to evaluate any billing system options that may be considered for invoicing and collecting a stormwater fee.

5-1 GIS Coverages

Please describe what you have available for the most recent GIS data, including but not limited to:

- Impervious surface layer(s) – if different than the State's layer
- Aerial imagery
- Parcel boundary data
- City or Stormwater Service Area boundary
- Watershed and subwatershed boundaries
- Storm drain and sanitary sewer networks

Based on what is available, we will clarify what data we want and provide a location for data upload.

5-2 Databases

As applicable please provide or point us in the right direction for:

- Tax assessor database showing information regarding property ownership, land use, building information, condo or multiple ownership indicators, etc.
- Sample bills and export of database for water and/or sewer utility showing account information structure.

6) **COMMUNITY PERSPECTIVE & NEEDS**

We would like to gather information on any community concerns, opinions, or sensitivities that you may have gathered regarding both the program and stormwater user fee financing through your public outreach efforts.

6-1 Outreach Education:

- List of specific outreach programs, if any
- Type of outreach conducted (Open houses; workshops; neighborhood meeting; brochures):
 - Type of audience targeted:
 - Frequency of outreach activities

6-2 Community Perspectives on Stormwater Program and Fees:

- Level of community awareness: Low Medium High
- Key Community Sensitivities (examples):
 - Rate Affordability
 - Environmental Protection & Sustainability
 - No new fees or taxes
 - Political Issues
 - Other

6-3 Problems, Needs and Issues:

Based on your knowledge of the community what would say are the top five reasons that your community would find most compelling in support of establishing stormwater funding through a user fee? Refer to the attached technical memo “Understanding Stormwater Program Drivers” for additional background information. Examples might be:

- Wastewater or septic pressures
- Flooding problems
- Aging infrastructure
- Compliance requirements
- Development pressures
- Ecological concerns
- Quality of life & aesthetics
- Restore Shellfish Waters
- Reduce Beach Closures
- Preservation of property value
- Erosion of channels & streams
- Preserve recreation or fisheries
- Lawsuits
- Sustainability
- Water Quality Protection (rivers, ponds, Narragansett Bay, etc.)
- Others? _____

6-4 Hurdles

Based on your knowledge of the community and its leaders what would you say are the top five hurdles or obstacles to successful implementation of a regional stormwater program and user fee? Typical concerns might be:

- One area “bailing out” another one – “paying for another’s past sins”
- Losing local control of zoning, land use, etc. – “big brother decides for me”
- Building a bureaucracy – “fee creep”
- Consistency in treatment, fairness – “getting my share”
- Responsiveness – “who controls priorities”
- Being penalized for another’s non-compliance
- Being dominated by one entity
- The various entities have needs that are very different

6-5 Potential Regional Stormwater Utility Framework

What are your thoughts on how a regional stormwater utility might look for the Upper Narragansett Bay communities? Please describe below and think about what “regional” means to you.

- **Regional program**
 - *“we share some common elements”*
- **Regional organization**
 - *“our administration is cooperative”*
- **Regional funding**
 - *“our funding approach looks the same and saves cost”*

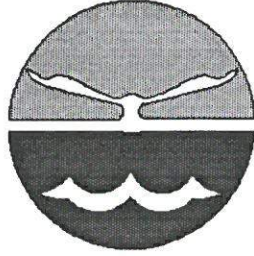
Your Description: _____

AMEC will provide an FTP site for each community to upload data and reports.

Person Completing this Survey: _____
Title: _____
Phone: _____
e-mail: _____

Appendix VI

Separate Sewerage Areas from the February 16, 1994
Concept Design Report by Louis Berger & Associates, Inc.



Concept Design Report

Volume I

Sections 1 - 5

February 16, 1994

Prepared for:

*The Narragansett Bay Commission
235 Promenade Street
Providence, Rhode Island
02908*

Prepared by:

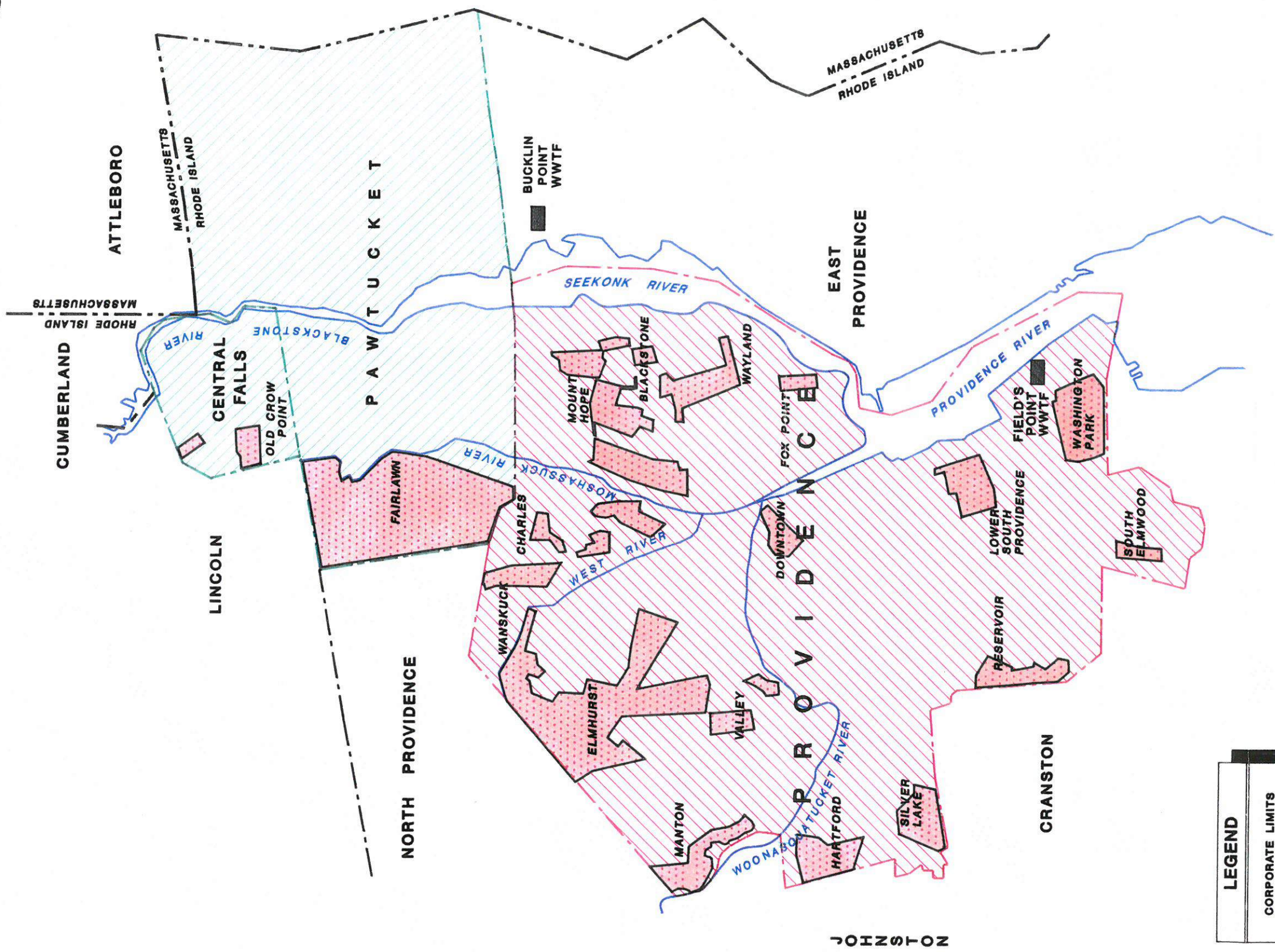
*Louis Berger & Associates, Inc.
295 Promenade Street
Providence, Rhode Island
02908*

REVIEWED AND APPROVED IN ACCORDANCE WITH THE
REQUIREMENTS OF THE RHODE ISLAND DEPARTMENT
OF ENVIRONMENTAL MANAGEMENT.

Date: July 15, 1994
Supervisor: William J. Fournier J.M.
Oliver N. Good
Chief, Division of Water Resources

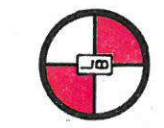
**TABLE 2.1-1
 SEPARATED SEWERAGE AREAS**

Neighborhood	Major Street or Feature within the Neighborhood	Separated Sewerage Area (Approximate Acreage)	Percentage of Land Area
PROVIDENCE			
		Total Land Area = 11,815 acres	
South Elmwood	Roger William Park	48	0.4
Washington Park	Narragansett Blvd. / Eddy St.	147	1.2
Reservoir	Mashpaug Pond	97	0.8
Silver Lake	Silver Lake Ave. / Pocasset Ave.	147	1.2
Hartford	Int. 195 / Hartford Ave.	122	1.0
Manton	Manton Ave. / Fruit Hill Ave.	134	1.1
Elmhurst	Admiral St. / Sharon St.	901	7.6
Wanskuck	Douglas Ave. / Branch Ave.	317	2.7
Charles	Charles St./ Route 146	456	3.9
Mount Hope	Int. 95 / North Main St.	400	3.4
Blackstone	Blackstone Blvd. / Elmgrove Ave.	359	3.0
Wayland	Blackstone Blvd. / Lloyd Ave.	386	3.3
Fox Point	Angell St. / Brook St.	60	0.5
Lower South Providence	Eddy St. / Prairie Ave.	172	1.5
		Area of Separated Sewers = 3,746 acres	31.7 %
PAWTUCKET			
		Total Land Area = 5,591 acres	
Fairlawn	Power Ave. / Smithfield Ave.	938	16.8
		Area of Separated Sewers = 938 acres	16.8 %
CENTRAL FALLS			
		Total Land Area = 774 acres	
Old Crow Point	Bagley St./ Emmet St.	18	2.3
Richland Ave.	Richland Ave. / Cliff St.	4	0.5
		Area of Separated Sewers = 22 acres	2.8 %



LEGEND

- CORPORATE LIMITS
- BUCKLIN POINT STUDY AREA
- FIELD'S POINT STUDY AREA
- SEPARATED SEWER AREA



LOUIS BERGER & ASSOCIATES INC.
NARRAGANSETT BAY COMMISSION
COMBINED SEWER OVERFLOW
CONTROL FACILITIES

SCALE: 1" = 5000'

SEPARATED SEWERAGE SYSTEMS

Figure: 2.1 - 3

Appendix VII

GIS Data for Each Municipality

Appendix VIII

Additional Regional Approach:
Upper Narragansett Bay Regional Clean Water Authority

Appendix VIII – Additional Regional Approach: Upper Narragansett Bay Regional Clean Water Authority

Additional Regional Approach

During the development of the final report, the Consultant Team reviewed the results of Phase I Feasibility Study and feedback on the draft report to offer an additional regional approach for future consideration. Some of the key concerns expressed by members of the Steering Committee and Stakeholder Group, regarding the various approaches evaluated during the feasibility study, centered around the following key factors:

- There are differences in the operations and capital needs, system characteristics, and customer base demographics between municipalities that have both a Combined Sewer System (CSS) and Municipal Separate Storm Sewer System (MS4) service areas versus municipalities that have a 100% MS4 system. At the same time, these systems both convey stormwater and have an impact on water quality in the Upper Narragansett Bay. A key concern is that a single regional entity approach for the MS4 system does not address these differing needs and an integrated approach may provide a more effective and consistent level of service for all infrastructure.
- NBC as a regional wastewater treatment entity already has significant compliance and consent decree obligations to meet, and hence the potential of taking on the management of CSS laterals would represent a significant increase in effort and related service cost increases. Note that Table 4.1 in the Phase I Feasibility Study Report only presented options for the CSS laterals to be managed by the local municipalities or NBC.
- In Central Falls, Pawtucket, and Providence, the CSS represents key infrastructure that conveys both stormwater and sanitary sewage that discharges to NBC's interceptors. In addition, in some areas, flows which are initially conveyed through separate sanitary sewer collection systems also discharge to the CSS and NBC's interceptors. There are unmet needs associated with each of these systems related to operation and maintenance (O&M), infiltration and inflow reduction, Sanitary Sewer Overflow (SSO) mitigation, and capital improvements. There is also a need to improve the management of the separate sanitary sewer collection systems in these three communities.

To better address these concerns, the Consultant Team developed an additional regional approach based on the concept of integrating the management of the CSS and separate sanitary sewer systems of the three CSS communities, and the management of the MS4 systems in all of the six participating communities, under a single regional authority referred to as the "Upper Narragansett Bay Regional Clean Water Authority" (RCWA).

Regional Clean Water Authority Approach

Upper Narragansett Bay Regional Clean Water Authority

A **Regional Clean Water Authority** could potentially have two distinct operational divisions, namely the "**Sewer Collections Division**" and the "**Stormwater Division**", and be responsible for the following services:

Appendix VIII – Additional Regional Approach: Upper Narragansett Bay Regional Clean Water Authority

Sewer Collections Division

This division would be responsible for the following activities for portions of the collection system under municipal control, specific to the three CSS communities of Central Falls, Pawtucket, and Providence:

- CSS lateral collection systems O&M and infrastructure management
- Separate sanitary sewer collection systems O&M and infrastructure management
- SSO mitigation programs management (coordinated with NBC's program)
- Planning, engineering and construction management related to CSS and separate sanitary sewer collection systems

The other three non-CSS communities (East Providence, Cranston, and Warwick) would continue to own and operate their own sanitary sewer collection and treatment systems (funded with their separate sewer use collection fees) as they currently do now. Note: the northern portion of East Providence and a small section of Cranston is serviced by the NBC for wastewater treatment.

Stormwater Division

This division would be responsible for following activities related to the MS4 systems in all six municipalities:

- Water quality programs
- Municipal Separate Storm Sewer (MS4) collector systems & local flooding
- Streams and floodplain management
- Green infrastructure program across MS4 and CSS areas
- Planning, engineering and construction management related to the MS4

Funding Approach

The Regional Clean Water Authority could institute two mutually exclusive and distinct service charges as follows:

- "Sanitary Sewer User Fees and Charges" to support the Sewer Collections Division operations. The sanitary sewer user fees and charges would be applicable only to the three CSS communities.
- "Stormwater User Fees and Charges" to support the stormwater division operations. The stormwater user fees and charges would be applicable to all of the six municipalities.

Since the CSS in Central Falls, Pawtucket and Providence also collect and convey stormwater, to enable equitable cost recovery, the potential of apportioning the CSS costs between the sanitary sewer charge and stormwater charge could also be evaluated.

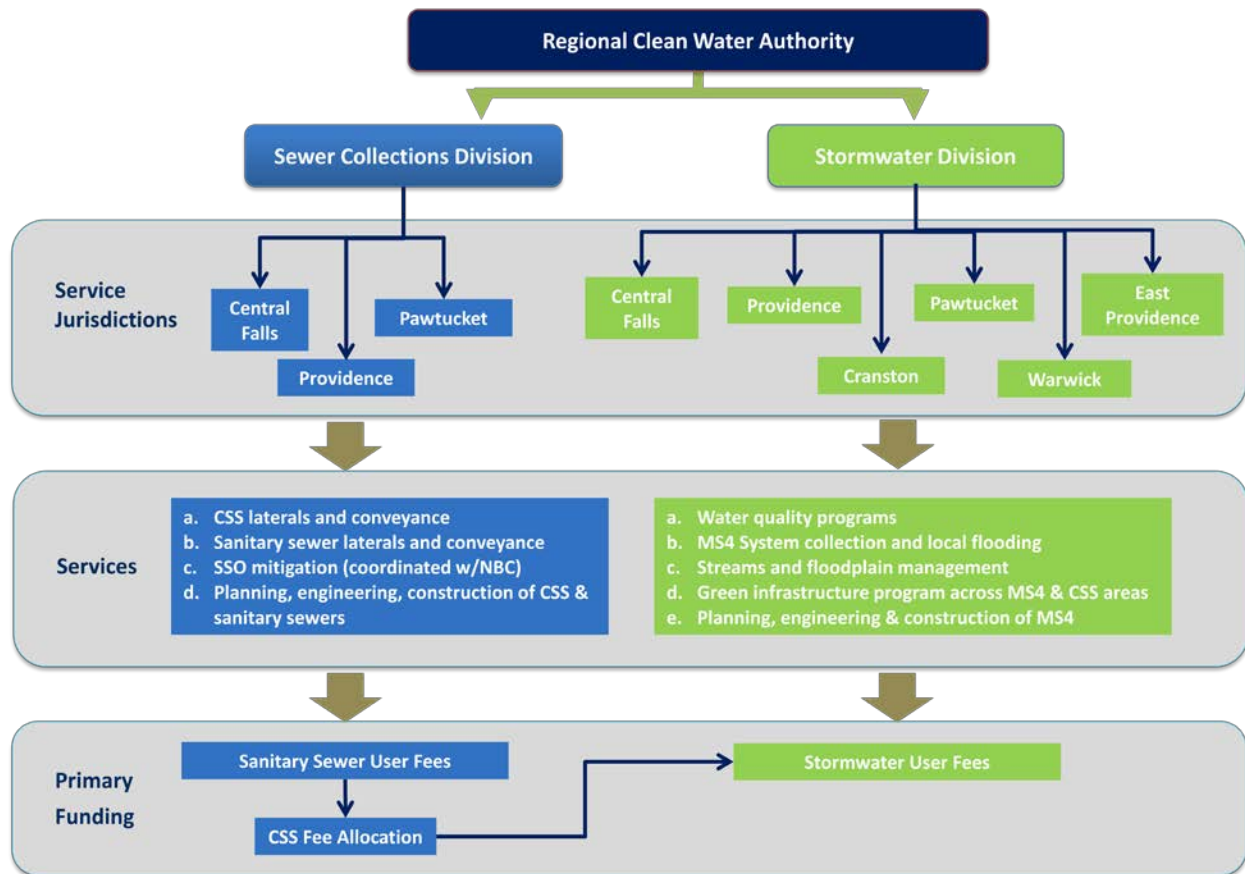
This regional approach with two distinct divisions could provide the much needed flexibility in addressing the diverse needs of the communities and interrelated infrastructure, while enabling

Appendix VIII – Additional Regional Approach: Upper Narragansett Bay Regional Clean Water Authority

significant coordination in the delivery and efficiency of services with a cohesive administration for the Regional Clean Water Authority.

Figure 1 illustrates the Regional Clean Water Authority approach that could be evaluated further in the Phase II Planning Study. This may also alleviate the need to delineate the CSS areas and impose additional obligations on NBC at this time. It is important to note that this approach represents an expansion to the approach outlined in Section 5.2 of the report and options to phase in this effort may need to be considered.

Figure 1 – Regional Clean Water Authority Approach



Appendix IX

Future Program Cost Summary Tables 2012 Rhode Island Clean Water Needs Survey

Central Falls, RI

Stormwater Program Cost Analysis

Estimate of Current Program Costs (2014 Approved)

Key Cost Center	Annual Cost*
Administration	\$ 7,524
<i>Indirect cost allocation (20%)</i>	\$ 8,861
Operations and Maintenance	\$ 36,783
Engineering and Master Planning	\$ -
Regulation/Enforcement	\$ -
Capital Improvement Projects	\$ -
<i>Major Capital Projects</i>	\$ -
<i>Minor Capital Projects</i>	\$ -
Water Quality Monitoring	\$ -
Total	\$ 53,168

Notes & Assumptions:
 20% of the 20% of the 3% total labor allocation
 Indirect cost allocation (% total budget)
 20% of the 3% total labor allocation
 CSS only, none for MS4
 CSS only, none for MS4
 CSS only, none for MS4
 No sig. costs/budget
 No sig. costs/budget
 None conducted

\$ 44,307 Program cost w/out indirect cost allocations
 \$ 8,861 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Estimate of Future Program Costs (avg. 2015-2019)

Key Cost Center	Annual Cost*
Administration	\$ 9,406
<i>Indirect cost allocation (20%)</i>	\$ 14,755
Operations and Maintenance	\$ 64,370
Engineering and Master Planning	\$ -
<i>BMP Design</i>	\$ -
Regulation/Enforcement	\$ -
Capital Improvement Projects	\$ -
<i>Major Capital Projects</i>	\$ -
<i>Minor Capital Projects</i>	\$ -
Water Quality Monitoring	\$ -
Total	\$ 88,530

Notes & Assumptions:
 25% increase overall
 Indirect cost allocation (% total budget)
 25% increase overall
 CSS only, none for MS4
 CSS only, none for MS4
 CSS only, none for MS4
 CSS only, none for MS4
 No sig. costs/budget
 No sig. costs/budget
 No sig. costs/budget

\$ 73,775 Program cost w/out indirect cost allocations
 \$ 14,755 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Central Falls, RI
Stormwater Program Cost Analysis
SUMMARY

Key Cost Center	Annual Cost*	Notes
Administration	\$ 7,524	20% of the 3% total labor allocation
Operations and Maintenance	\$ 36,783	20% of the 3% total labor allocation, plus 3% of materials and expenses
Engineering and Master Planning	\$ -	CSS only, none for MS4
Regulation/Enforcement	\$ -	CSS only, none for MS4
Capital Improvement Projects	\$ -	CSS only, none for MS4
<i>Major Capital Projects</i>	\$ -	CSS only, none for MS4
<i>Minor Capital Projects</i>	\$ -	CSS only, none for MS4
Water Quality Monitoring	\$ -	Do not perform
Total	\$ 44,307	

Note: *fully-burdened labor, equip. & exp.

<u>Materials & Expenses Budget Line Items</u>	2014-approved	% Stormwater	Cost
53003: Other Supplies	\$ 1,793	3%	\$ 54
53009: Vehicle Fuels	\$ 58,605	3%	\$ 1,758
53216: Non-Capital Equipment	\$ 7,003	3%	\$ 210
53317: Winter Road Supplies	\$ 10,063	3%	\$ 302
54011 DPW Build R/M	\$ 1,703	3%	\$ 51
54012: Vehicle R/M	\$ 80,724	3%	\$ 2,422
54033: Other Professional Services	\$ 1,371	0%	\$ -
54038: Road R/M	\$ 47,463	3%	\$ 1,424
54221: Education/Training	\$ 515	0%	\$ -
54556: Sewer/NBC	\$ 14,766	3%	\$ 443
59109; Misc Highway	\$ 712	3%	\$ 21
		Total	\$ 6,685

<u>Fully Burdened Labor Cost Analysis</u>	Salaries	% Stormwater	Total
51101: Salaries	\$ 825,189	3%	\$ 24,756
51120: Overtime	\$ 47,463	3%	\$ 1,424
51140: Longevity Pay	\$ 31,500	3%	\$ 945
52025: Allowances	\$ 5,036	3%	\$ 151
52045: Social Security	\$ 56,370	3%	\$ 1,691
52050: Medicare	\$ 13,183	3%	\$ 395
52052: Municipal State Pension	\$ 109,707	3%	\$ 3,291
52066: Medical Insurance	\$ 149,589	3%	\$ 4,488
52067: Dental Insurance	\$ 16,031	3%	\$ 481
		Total	\$ 37,622

Cranston, RI

Stormwater Program Cost Analysis

Estimate of Current Program Costs (2014 Approved)

Key Cost Center	Annual Cost*
Administration	\$ 23,504
<i>Indirect cost allocation (20%)</i>	\$ 225,679
Operations and Maintenance	\$ 536,551
Engineering and Master Planning	\$ 8,481
Regulation/Enforcement	\$ 9,858
Capital Improvement Projects	\$ 550,000
<i>Major Capital Projects</i>	\$ 300,000
<i>Minor Capital Projects</i>	\$ 250,000
Water Quality Monitoring	\$ -
Total	\$ 1,354,073

Notes & Assumptions:

Staff time for DPW Administration (salary)
 Indirect cost allocation (% total budget)
 Staff time across multiple departments (salary) & expense budgets
 Staff time across multiple departments (salary)
 Staff time across multiple departments (salary)
 Total
 City-wide drainage improvements
 Water quality projects (Lake St. Outfall)
 None conducted

\$ 1,128,394 Program cost w/out indirect cost allocations
 \$ 225,679 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Estimate of Future Program Costs (avg. 2015-2019)

Key Cost Center	Annual Cost*
Administration	\$ 28,205
<i>Indirect cost allocation (20%)</i>	\$ 272,532
Operations and Maintenance	\$ 804,827
Engineering and Master Planning	\$ 39,841
<i>BMP Design</i>	\$ 50,000
Regulation/Enforcement	\$ 14,788
Capital Improvement Projects	\$ 375,000
<i>Major Capital Projects</i>	\$ 300,000
<i>Minor Capital Projects</i>	\$ 75,000
Water Quality Monitoring	\$ 50,000
Total	\$ 1,635,193

Notes & Assumptions:

20% increase overall
 Indirect cost allocation (% total budget)
 50% increase overall
 75% above current effort, plus \$25K in TMDL planning
 Design 1 BMP each year to address impaired waters and/or TMDL requirements (e.g., Spectacle Pond)
 50% increase overall
 Total
 City-wide drainage improvements (existing budget)
 Capital reserve to construct 1 BMP in next 5 years to address one impaired watershed
 RIPDES permit requirements for IDDE & baseline WQ monitoring

\$ 1,362,661 Program cost w/out indirect cost allocations
 \$ 272,532 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Cranston, RI

Stormwater Program Cost Analysis

SUMMARY

Key Cost Center	Annual Cost*	Notes
Administration	\$ 23,504	See codes
Operations and Maintenance	\$ 536,551	See codes
Engineering and Master Planning	\$ 8,481	See codes
Regulation/Enforcement	\$ 9,858	See codes
Capital Improvement Projects	\$ 550,000	Total
<i>Major Capital Projects</i>	\$ 300,000	See codes
<i>Minor Capital Projects</i>	\$ 250,000	See codes
Water Quality Monitoring	\$ -	Do not perform
Total	\$ 1,128,394	

Note: *fully-burdened labor, equip. & exp.

<u>Material & Expense Budget Line Items</u>	2014-approved	% Stormwater	Cost
6 wheel HD Dump/plow/sand trucks	\$ 320,000	30%	\$ 96,000
Street Sweeping	\$ 185,000	100%	\$ 185,000
Citywide Storm Drain Improvements	\$ 300,000	100%	\$ 300,000
Lake Street Outfall	\$ 250,000	100%	\$ 250,000
Total Line Items			\$ 831,000

<u>Fully Burdened Labor Cost Analysis</u>	Budget	% of Budget	SW Cost	Budget Page
Department of Planning	\$ 559,898	2%	\$ 11,198	6
Department of Inspections	\$ 985,847	1%	\$ 9,858	6
Division of Information Technology	\$ 1,230,623	1%	\$ 12,306	7
Department of Public Works	\$ 1,548,358	10%	\$ 154,836	7
Department of Highway Maintenance	\$ 3,763,976	2%	\$ 75,280	7
Department of Engineering	\$ 424,035	2%	\$ 8,481	8
Care of Trees	\$ 95,000	2%	\$ 1,900	8
Division of Fleet Maintenance	\$ 1,176,786	2%	\$ 23,536	8
Total Operations			\$ 297,394	

East Providence, RI Stormwater Program Cost Analysis

Estimate of Current Program Costs (2014 Approved)

Key Cost Center	Annual Cost*
Administration	\$ 15,000
<i>Indirect cost allocation (20%)</i>	\$ 45,900
Operations and Maintenance	\$ 157,000
Engineering and Master Planning	\$ 37,000
Regulation/Enforcement	\$ -
Capital Improvement Projects	\$ -
<i>Major Capital Projects</i>	\$ -
<i>Minor Capital Projects</i>	\$ -
Water Quality Monitoring	\$ 20,500
Total	\$ 275,400

Notes & Assumptions:

Staff time for DPW Administration (salary)
 Indirect cost allocation (% total budget)
 Staff time across multiple departments (salary) & expense budgets
 Staff time across multiple departments (salary)
 No significant costs
 None at this time

RIPDES Permit, water quality monitoring, IDDE

\$ 229,500 Program cost w/out indirect cost allocations
 \$ 45,900 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Estimate of Future Program Costs (avg. 2015-2019)

Key Cost Center	Annual Cost*
Administration	\$ 18,000
<i>Indirect cost allocation (20%)</i>	\$ 115,450
Operations and Maintenance	\$ 235,500
Engineering and Master Planning	\$ 89,750
<i>BMP Design</i>	\$ 50,000
Regulation/Enforcement	\$ 7,500
Capital Improvement Projects	\$ 125,000
<i>Major Capital Projects</i>	\$ 75,000
<i>Minor Capital Projects</i>	\$ 50,000
Water Quality Monitoring	\$ 51,500
Total	\$ 692,700

Notes & Assumptions:

20% increase overall
 Indirect cost allocation (% total budget)
 50% increase overall
 75% above current effort, plus \$25K in TMDL planning
 Design 1 BMP each year to address impaired water and/or TMDL requirements (e.g., land use, IDDE), 1/2 of current administration cost
 Total
 Capital reserve to construct 1 BMP in next 5 years to address one impaired watershed
 Reserve for priority drainage repairs
 RIPDES permit requirements, IDDE & baseline WQ monitoring (considers current efforts)

\$ 577,250 Program cost w/out indirect cost allocations
 \$ 115,450 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

East Providence, RI
Stormwater Cost of Service Analysis: Fully-Burdened Personnel
Costs; Summary by Cost Subcategory

Major Cost Category	Existing
<i>Cost Subcategory</i>	2014
Administration	
<i>General Stormwater Program Administration</i>	\$ 15,000.00
Subtotal:	\$ 15,000.00
Engineering and Master Planning	
<i>Maintenance and Field Engineering Support</i>	\$ 10,000.00
<i>GIS, Database, and Mapping</i>	\$ 22,000.00
<i>Flood Insurance and Community Rating System</i>	\$ 5,000.00
Subtotal:	\$ 37,000.00
Operations and Maintenance	
<i>Operations and Maintenance Management</i>	\$ 24,000.00
<i>Storm Sewer and Culvert Maintenance</i>	\$ 80,000.00
<i>Inlet, Catch Basin, and Manhole Inspection and/or Cleaning</i>	\$ 30,000.00
<i>Street Sweeping</i>	\$ 10,000.00
<i>Street Sweeping-Fall Leaf Program</i>	\$ 10,000.00
<i>Detention/retention System Maintenance</i>	\$ 3,000.00
Subtotal:	\$ 157,000.00
Regulation/Enforcement	
Subtotal:	\$ -
Capital Improvements	
Subtotal:	\$ -
Stormwater Quality	
<i>RIPDES Phase II Permit Administration and Reporting</i>	\$ 10,000.00
<i>Water Quality Monitoring</i>	\$ 2,500.00
<i>Illicit Discharge Detection & Elimination Program</i>	\$ 7,000.00
<i>Public Education Program</i>	\$ 1,000.00
Subtotal:	\$ 20,500.00
TOTAL:	\$ 229,500.00

North Providence, RI Stormwater Program Cost Analysis

Estimate of Current Program Costs (2014 Approved)

Key Cost Center	Annual Cost*
Administration	\$ 15,000
<i>Indirect cost allocation (20%)</i>	\$ 19,641
Operations and Maintenance	\$ 70,750
Engineering and Master Planning	\$ -
Regulation/Enforcement	\$ -
Capital Improvement Projects	\$ -
<i>Major Capital Projects</i>	\$ -
<i>Minor Capital Projects</i>	\$ -
Stormwater Quality	\$ 12,456
Total	\$ 117,847

Notes & Assumptions:

Staff time for DPW Administration (salary)
 Indirect cost allocation (% total budget)
 Staff time across multiple departments (salary) & expense budgets
 No sig. costs/budget
 No sig. costs/budget
 No sig. costs/budget
 No sig. costs/budget
 No sig. costs/budget
 NPDES Permit compliance

\$ 98,206 Program cost w/out indirect cost allocations
 \$ 19,641 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Estimate of Future Program Costs (avg. 2015-2019)

Key Cost Center	Annual Cost*
Administration	\$ 22,500
<i>Indirect cost allocation (20%)</i>	\$ 83,309
Operations and Maintenance	\$ 141,500
Engineering and Master Planning	\$ 32,500
<i>BMP Design</i>	\$ 50,000
Regulation/Enforcement	\$ 7,500
Capital Improvement Projects	\$ 125,000
<i>Major Capital Projects</i>	\$ 75,000
<i>Minor Capital Projects</i>	\$ 50,000
Water Quality Monitoring	\$ 37,544
Total	\$ 499,853

Notes & Assumptions:

50% increase overall
 Indirect cost allocation (% total budget)
 100% increase overall
 1/2 current administration effort, plus \$25K in TMDL planning
 Design 1 BMP each year to address impaired waters and/or TMDL requirements
 Staff time related to inspection and enforcement (e.g., land use, IDDE), 1/2 of current administration cost
 Capital reserve to construct 1 BMP in next 5 years to address one watershed TMDL
 Reserve for priority drainage repairs
 WQ monitoring (\$50K minus current RIPDES Permit compliance effort)

\$ 416,544 Program cost w/out indirect cost allocations
 \$ 83,309 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

North Providence, RI	
Stormwater Cost of Service Analysis: Fully-Burdened Personnel Costs; Summary by Cost Subcategory	
Major Cost Category	Existing
<i>Cost Subcategory</i>	2014
Administration	
<i>General Stormwater Program Administration</i>	\$ 15,000.00
Subtotal:	\$ 15,000.00
Engineering and Master Planning	
Subtotal:	\$ -
Operations	
<i>Operations and Maintenance Management</i>	\$ 5,750.00
<i>Storm Sewer and Culvert Maintenance</i>	\$ 10,000.00
<i>Street Sweeping</i>	\$ 55,000.00
Subtotal:	\$ 70,750.00
Regulation/Enforcement	
Subtotal:	\$ -
Capital Improvements	
Subtotal:	\$ -
Stormwater Quality	
<i>NPDES Administration and Reporting</i>	\$ 12,456.00
Subtotal:	\$ 12,456.00
TOTAL:	\$ 98,206.00

Pawtucket, RI

Stormwater Program Cost Analysis

Estimate of Current Program Costs (2014 Approved)

Key Cost Center	Annual Cost*
Administration	\$ 795
<i>Indirect cost allocation (20%)</i>	\$ 22,624
Operations and Maintenance	\$ 62,532
Engineering and Master Planning	\$ 16,893
Regulation/Enforcement	\$ 7,399
Capital Improvement Projects	\$ -
<i>Major Capital Projects</i>	\$ -
<i>Minor Capital Projects</i>	\$ 25,500
Water Quality Monitoring	\$ -
Total	\$ 135,743

Notes & Assumptions:

Administrative expenses (note that labor is captured under O&M)
 Indirect cost allocation (% total budget)
 Staff time (salary) & expense budgets (8-17% allocation for MS4 only)
 Consultant & vendor
 Development plan review
 None conducted
 No sig. costs/budget
 Minor repairs for MS4 only
 None conducted

\$ 113,119 Program cost w/out indirect cost allocations
 \$ 22,624 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Estimate of Future Program Costs (avg. 2015-2019)

Key Cost Center	Annual Cost*
Administration	\$ 1,589
<i>Indirect cost allocation (20%)</i>	\$ 74,424
Operations and Maintenance	\$ 109,432
Engineering and Master Planning	\$ 75,000
<i>BMP Design</i>	\$ 50,000
Regulation/Enforcement	\$ 11,099
Capital Improvement Projects	\$ 100,000
<i>Major Capital Projects</i>	\$ 75,000
<i>Minor Capital Projects</i>	\$ 25,000
Water Quality Monitoring	\$ 25,000
Total	\$ 446,544

Notes & Assumptions:

100% increase overall
 Indirect cost allocation (% total budget)
 75% increase overall
 \$50K in mapping & evaluation, plus \$25K in TMDL planning
 Design 1 BMP each year to address impaired waters and/or TMDL requirements
 50% increase overall
 Total
 Capital reserve to construct 1 BMP in next 5 years to address one impaired watershed
 Reserve for priority drainage repairs
 RIPDES permit requirements for IDDE & baseline WQ monitoring

\$ 372,120 Program cost w/out indirect cost allocations
 \$ 74,424 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

**Pawtucket, RI
Stormwater Program Cost Analysis**

SUMMARY

Key Cost Center	Annual Cost*	Notes
Administration	\$ 795	See codes
Operations and Maintenance	\$ 62,532	See codes
Engineering and Master Planning	\$ 16,893	See codes
Regulation/Enforcement	\$ 7,399	Development plan review
Capital Improvement Projects	\$ -	No sig. costs/budget
<i>Major Capital Projects</i>	\$ -	No sig. costs/budget
<i>Minor Capital Projects</i>	\$ 25,500	Minor repairs for MS4 only
Water Quality Monitoring	\$ -	Do not perform
Total	\$ 113,119	

Note: *fully-burdened labor, equip. & exp.

Line Items	Avg. FY12-FY14 Cost	% of Cost	Cost	Notes	FY12	FY13	FY14
Div 30: Sewer Maintenance	\$ 421,329	8%	\$ 33,706	General system O&M	\$ 407,344	\$ 493,971	\$ 362,671
552.30-50: Consultant	\$ 11,574	20%	\$ 2,315		\$ 4,721	\$ 15,000	\$ 15,000
552.30-70: Outside Vendors	\$ 28,073	8%	\$ 2,246		\$ 25,719	\$ 28,500	\$ 30,000
552.42-30: Tires	\$ 333	8%	\$ 27		\$ -	\$ 500	\$ 500
552.42-50: Outside Parts	\$ 11,319	8%	\$ 906		\$ 13,957	\$ 10,000	\$ 10,000
552.43-20: General Maintenance	\$ 4,923	8%	\$ 394		\$ 2,769	\$ 6,000	\$ 6,000
552.43-40: Communication Maintenance	\$ 700	8%	\$ 56		\$ 500	\$ 800	\$ 800
552.43-86: Pumping Station Services	\$ 20,180	0%	\$ -		\$ 20,541	\$ 20,000	\$ 20,000
552.44-45: Work Clothing	\$ 1,119	8%	\$ 89		\$ 356	\$ 1,500	\$ 1,500
552.50-10: Telephone	\$ 4,312	8%	\$ 345		\$ 4,715	\$ 4,110	\$ 4,110
552.50-13: Cellular Phones	\$ 721	8%	\$ 58		\$ 789	\$ 937	\$ 436
552.50-20: Electric Bills	\$ 4,000	8%	\$ 320		\$ 3,386	\$ 4,241	\$ 4,374
552.50-60: Narragansett Bay Comm.	\$ 56,454	8%	\$ 4,516		\$ 49,066	\$ 56,239	\$ 64,057
552.60-20: Gas & Oil	\$ 12,296	8%	\$ 984		\$ 10,636	\$ 12,099	\$ 14,153
552.60-50: Housekeeping	\$ 200	8%	\$ 16		\$ -	\$ 300	\$ 300
552.60-59: Safety Supplies	\$ 547	8%	\$ 44		\$ 240	\$ 700	\$ 700
TOTAL			\$ 46,021				

Additional Items to Provide Cost	Cost	% of Cost	Cost	Notes
Street sweeping	\$33,543.04	17%	\$ 5,702	80 man hours (@\$20/hr± + 23.3% fringes) dedicated to this every other week for 8 months
Catch basin cleaning	\$67,086.08	17%	\$ 11,405	80 man hours (@ \$20/hr± + 23.3% fringes) dedicated to this every week for 8 months
Equipment maintenance	\$28,000.00	17%	\$ 4,760	Sweepers (\$180k new), each replaced once every 20 years, or one new vehicle every 10 years.
Floodplain management	\$246,640.00	5%	\$ 12,332	Planning Dept Staff indicates 3% of total annual effort dedicated to this. Combined annual salary est. @ \$200k
Code enforcement	\$369,960.00	2%	\$ 7,399	Planning, Engineering, & Zoning staff attend approx. 1 development plan review meeting each month, or 1% of total annual effort. Combined annual salaries est. @ \$300k
Sewer maintenance bond (annual allowance)	\$150,000.00	17%	\$ 25,500	Drainage system repairs (grate replacement, manhole & catch basin repair)

Providence, RI

Stormwater Program Cost Analysis

Estimate of Current Program Costs (2014 Approved)

Key Cost Center	Annual Cost*
Administration	\$ 70,129
<i>Indirect cost allocation (20%)</i>	\$ 224,390
Operations and Maintenance	\$ 899,112
Engineering and Master Planning	\$ 107,262
Regulation/Enforcement	\$ 45,450
Capital Improvement Projects	\$ -
<i>Major Capital Projects</i>	\$ -
<i>Minor Capital Projects</i>	\$ -
Water Quality Monitoring	\$ -
Total	\$ 1,346,343

Notes & Assumptions:

Staff time for DPW Administration (salary)
 Indirect cost allocation (% total budget)
 Staff time across multiple departments (salary) & expense budgets
 Staff time across multiple departments (salary)
 Staff time across multiple departments (salary)
 None conducted, periodic grants only
 No sig. costs/budget
 No sig. costs/budget
 None conducted

\$ 1,121,952 Program cost w/out indirect cost allocations
 \$ 224,390 20% program costs (indirect cost allocations)

Note: *fully-burdened labor (70% benefits), equip. & exp.

Estimate of Future Program Costs (avg. 2015-2019)

Key Cost Center	Annual Cost*
Administration	\$ 84,155
<i>Indirect cost allocation (20%)</i>	\$ 552,608
Operations and Maintenance	\$ 2,023,002
Engineering and Master Planning	\$ 212,708
<i>BMP Design</i>	\$ 50,000
Regulation/Enforcement	\$ 68,174
Capital Improvement Projects	\$ 275,000
<i>Major Capital Projects</i>	\$ 200,000
<i>Minor Capital Projects</i>	\$ 75,000
Water Quality Monitoring	\$ 50,000
Total	\$ 3,315,647

Notes & Assumptions:

20% increase overall
 Indirect cost allocation (% total budget)
 125% increase overall
 75% above current effort, plus \$25K in TMDL planning
 Design 1 BMP each year to address impaired waters and/or TMDL requirements (e.g., Roger Williams Park Pond)
 50% increase in effort
 Total
 Reserve for priority drainage repairs & replacement backlog
 Capital reserve to construct 1 BMP in next 5 years to address one impaired watershed
 RIPDES permit requirements for IDDE & baseline WQ monitoring

\$ 2,763,039 Program cost w/out indirect cost allocations
 \$ 552,608 20% program costs (indirect cost allocations)

Note: *fully-burdened labor (70% benefits), equip. & exp.

Providence, RI Stormwater Program Cost Analysis

SUMMARY

Key Cost Center	Cost*	Notes
Administration	\$ 70,129	See codes
Operations and Maintenance	\$ 899,112	See codes
Engineering and Master Planning	\$ 107,262	See codes
Regulation/Enforcement	\$ 45,450	See codes
Capital Improvement Projects	\$ -	No sig. costs/budget
<i>Major Capital Projects</i>	\$ -	No sig. costs/budget
<i>Minor Capital Projects</i>	\$ -	No sig. costs/budget
Water Quality Monitoring	\$ -	Do not perform
Total	\$ 1,121,952	

Note: *fully-burdened labor (70% benefits), equip. & exp.

Budget Line Items	2014-approved	% Stormwater	Cost
52345: Street Sweeping (101-506)	\$ 175,000	35%	\$ 61,250
52912: Repairs to Autos & Trucks (101-515)	\$ 190,000	20%	\$ 38,000

Fully Burdened Cost Analysis	Salaries	Benefits	Benefit Cost %	% Stormwater	Salaries	SW Cost	Fully-Burdened Cost (+70%)	Notes:
101-908: Planning & Urban Devel.	\$ 2,688,167	\$ 1,673,432	62.3%	2%	\$ 53,763	\$ 91,398	Plan review, urban redevelopment planning & floodplain management	
101-305: Traffic Engineering	\$ 466,585	\$ 286,912	61.5%	2%	\$ 9,332	\$ 15,864	Drainage issues	
101-501: Public Works Admin.	\$ 412,525	\$ 265,558	64.4%	10%	\$ 41,253	\$ 70,129	MS4 compliance, stormwater issues	
101-502: Engineering & Sanitation	\$ 353,869	\$ 246,612	69.7%	25%	\$ 88,467	\$ 150,394	Drainage repairs and issues	
101-508: Highway	\$ 1,992,691	\$ 1,605,650	80.6%	10%	\$ 199,269	\$ 338,757	Minor drainage repairs & sweeping operators	
101-511: Sewer Construction	\$ 369,919	\$ 284,907	77.0%	20%	\$ 73,984	\$ 125,772	Catch basin cleaning operators Maintenance of sweepers & catch basin cleaning truck	
101-515: Garage R&M Equipment	\$ 376,979	\$ 278,178	73.8%	10%	\$ 37,698	\$ 64,086	Land maintenance & litter control	
101-702: Neighborhood Park Services	\$ 2,417,077	\$ 1,792,168	74.1%	2%	\$ 48,342	\$ 82,181	Land maintenance & litter control	
101-703: Forestry Services	\$ 580,579	\$ 406,373	70.0%	2%	\$ 11,612	\$ 19,740	Land maintenance & litter control	
101-709: Superintendent of Parks	\$ 556,788	\$ 368,676	66.2%	2%	\$ 11,136	\$ 18,931	Land maintenance & litter control	
101-402: Structures & Zoning	\$ 925,072	\$ 442,628	47.8%	2%	\$ 18,501	\$ 31,452	Plan review & land use issues	
101-410: Bldg Inspect Code Enforc.	\$ 164,673	\$ 221,157	134.3%	5%	\$ 8,234	\$ 13,997	Development stormwater inspections	
Average			69.3%	Total	\$ 601,590	\$ 1,022,702		

Warwick, RI

Stormwater Program Cost Analysis

Estimate of Current Program Costs (2014 Approved)

Key Cost Center	Annual Cost*
Administration	\$ 6,429
<i>Indirect cost allocation (20%)</i>	\$ 90,219
Operations and Maintenance	\$ 188,681
Engineering and Master Planning	\$ 155,687
Regulation/Enforcement	\$ 9,663
Capital Improvement Projects	\$ 89,434
<i>Major Capital Projects</i>	\$ 37,434
<i>Minor Capital Projects</i>	\$ 52,000
Water Quality Monitoring	\$ 1,200
Total	\$ 541,312

Notes & Assumptions:

Staff time for DPW Administration (salary)
 Indirect cost allocation (% total budget)
 Staff time across multiple departments (salary) & expense budgets
 Staff time across multiple departments (salary) & expense budgets
 Staff time for Building Inspection Department (salary)
 Total
 Debt service on drainage bonds
 Minor drainage repairs & rehabilitation
 Beach testing

\$ 451,094 Program cost w/out indirect cost allocations
 \$ 90,219 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Estimate of Future Program Costs (avg. 2015-2019)

Key Cost Center	Annual Cost*
Administration	\$ 9,643
<i>Indirect cost allocation (20%)</i>	\$ 182,391
Operations and Maintenance	\$ 330,191
Engineering and Master Planning	\$ 269,609
<i>BMP Design</i>	\$ 50,000
Regulation/Enforcement	\$ 12,079
Capital Improvement Projects	\$ 190,434
<i>Major Capital Projects</i>	\$ 112,434
<i>Minor Capital Projects</i>	\$ 78,000
Water Quality Monitoring	\$ 50,000
Total	\$ 1,094,348

Notes & Assumptions:

50% increase overall
 Indirect cost allocation (% total budget)
 75% increase overall
 25% above current effort, plus \$50K outside services, plus \$25K in TMDL planning
 Design 1 BMP each year to address impaired waters and/or TMDL requirements
 25% increase overall
 Total
 Current cost plus capital reserve (\$75K) to construct 1 BMP in next 5 years to address one impaired watershed
 50% increase for priority drainage repairs
 RIPDES permit requirements for IDDE & baseline WQ monitoring

\$ 911,956 Program cost w/out indirect cost allocations
 \$ 182,391 20% program costs (indirect cost allocations)

Note: *fully-burdened labor, equip. & exp.

Warwick, RI Stormwater Program Cost Analysis

SUMMARY

Key Cost Center	Cost*	Notes
Administration	\$ 6,429	See codes
Operations and Maintenance	\$ 188,681	See codes
Engineering and Master Planning	\$ 155,687	See codes
Regulation/Enforcement	\$ 9,663	See codes
Capital Improvement Projects	\$ -	
<i>Major Capital Projects</i>	\$ 37,434	Debt service on drainage bonds
<i>Minor Capital Projects</i>	\$ 52,000	Minor drainage repairs & rehabilitation
Water Quality Monitoring	\$ 1,200	Beach testing
Total	\$ 451,094	

Note: *fully-burdened labor, equip. & exp.

Budget Line Items	2014-approved	% Stormwater	Cost	Budget Page	Notes:
20509 Drainage & Highway Bonds	\$ 249,557	15%	\$ 37,434	20 & 21	Debt service principal & interest
40277 Harbormaster Supplies	\$ 9,000	10%	\$ 900	41	Supplies for waste management
60386 Pawtuxet River Authority	\$ 1,500	100%	\$ 1,500	54	Watershed planning assistance
60446 URI Watershed Watch	\$ 1,200	100%	\$ 1,200	54	Water quality sampling (beaches)
63227 Supplies - Traffic Safety	\$ 20,000	50%	\$ 10,000	58	Drainage repairs
63230 Drainage Pipe	\$ 5,000	100%	\$ 5,000	58	Drainage repairs
63231 Gravel/Stone	\$ 40,000	50%	\$ 20,000	58	Drainage structure repairs
63232 Drainage Blocks	\$ 10,000	100%	\$ 10,000	58	Drainage structure repairs
63234 Frames and Covers	\$ 7,000	100%	\$ 7,000	58	Drainage structure repairs
63294 Tree Planting Program	\$ 2,000	50%	\$ 1,000	58	Tree benefits, target existing street scapes
63360 Professional Services	\$ 10,000	25%	\$ 2,500	59	Drainage analysis
63406 Greenwich Bay Stormwater Trees	\$ 5,250	100%	\$ 5,250	59	Stormwater tree replacement & maintenance
Public Works Commodities - 65211 to 65285	\$ 2,136,000	3%	\$ 64,080	61	Repair on trucks, sweeper, catch basin truck
Public Works Services - 65311 to 65328	\$ 362,500	3%	\$ 10,875	61	Repair on trucks, sweeper, catch basin truck
67360 Professional Services	\$ 40,000	10%	\$ 4,000	64	Drainage & flooding analysis
Total			\$ 180,739		

Fully Burdened Cost Analysis	Salaries	% of Budget	SW Cost	Burdened Rate (1.32)	Budget Page	Notes:
Management Information Systems	\$ 339,321	2%	\$ 6,786	\$ 8,958	25	Mapping & data management
Warwick Emergency Management	\$ 153,642	25%	\$ 38,411	\$ 50,702	35	Flood response
Building Inspection	\$ 732,063	1%	\$ 7,321	\$ 9,663	38	Site inspections for E&S and drainage issues
Parks & Recreation	\$ 184,024	1%	\$ 1,840	\$ 2,429	41	Harbormaster efforts related to water quality Plan review, urban redevelopment planning & floodplain management
Community Development	\$ 283,028	2%	\$ 5,661	\$ 7,472	53	
Department of City Planning	\$ 486,754	2%	\$ 9,735	\$ 12,850	54	Master Planning, flooding & water quality issues
Public Works - Administration	\$ 97,404	5%	\$ 4,870	\$ 6,429	57	MS4 compliance, stormwater & flooding issues
Public Works - Highway	\$ 3,236,870	2%	\$ 64,737	\$ 85,453	58	Street sweeping & catch basin cleaning operators
Public Works - Automotive	\$ 708,082	2%	\$ 14,162	\$ 18,693	61	Repair on trucks, sweeper, catch basin truck
Public Works - Engineering	\$ 256,459	20%	\$ 51,292	\$ 67,705	64	Salaries and professional services
Total			\$ 204,814	\$ 270,355		

Burdened Labor Rate

Personnel Services	\$ 101,191,447
Employee Benefits	\$ 24,249,285
Personnel Salaries	\$ 76,942,162
Benefit % of Salaries	31.5%



January 10, 2013

Mr. Jay Manning, P.E.
Principal Sanitary Engineer
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908

Re: Engineering Services for the 2012 Rhode Island Clean Water Needs Survey
Final Project Summary and Electronic Deliverable

Dear Jay:

This letter summarizes work completed by LimnoTech and Woodard & Curran for the 2012 Rhode Island Clean Water Needs Survey (CWNS). Efforts focused on documenting wastewater and stormwater needs for eligible facilities based on information provided by RIDEM, municipalities, and the 2004 CWNS.

Table 1 provided by EPA summarizes 2012 eligible need costs for each facility by need type. We identified \$1,921,624,776 in eligible needs from 37 wastewater (\$1.86B) and 16 stormwater (\$58.3M) facilities. Backup information that includes annotated documents and summary spreadsheets submitted to EPA is provided on a separate CD included as an attachment to this letter.

The sections below summarize the process LimnoTech and Woodard & Curran used to document eligible wastewater and stormwater needs and identify facilities with no needs. We have also provided recommendations to streamline future CWNS documentation processes.

Wastewater Needs

Woodard & Curran reviewed RIDEM's wastewater facilities log and 2004 CWNS facility fact sheets, interviewed RIDEM personnel to determine the relevance of RIDEM provided documents toward documenting CWNS needs, and contacted select communities to determine whether additional documentation not provided in RIDEM files was available to contribute to CWNS needs. This research was used to develop a comprehensive list of facilities and relevant documents to assess for CWNS eligibility. Facilities identified for potential inclusion in the CWNS included Rhode Island municipalities, the Narragansett Bay Commission, and other governmental and quasi-governmental entities, such as the Rhode Island Airport Corporation, Rhode Island EDC/Quonset Point, and Zambarano Memorial Hospital.

As part of a comprehensive approach, wastewater facilities plans, project priority lists (PPLs), capital improvement plans, and wastewater reports available from RIDEM were first reviewed to identify eligible projects. Cesspool data provided by RIDEM's OWTS Program was also reviewed to identify the number of cesspools requiring replacement as part of cesspool phase-out in Rhode Island. Eligible projects include those that have a water quality or public health need, documented capital cost, and were not completed prior to 2012.

Fifteen municipalities were contacted to verify both wastewater and stormwater needs where documentation was not readily available from RIDEM, or to confirm needs. Woodard & Curran also met with the Narragansett Bay Commission (NBC) to review wastewater needs and confirm eligible projects. NBC accounts for approximately \$943M or 49 percent of Rhode Island's total need.

Woodard & Curran annotated the location, need, solution, cost, cost type, and CWNS identification numbers for documents with eligible projects. Annotated documents and summary spreadsheets for each facility were provided to LimnoTech for a final review and additional annotations, if necessary. LimnoTech

provided documents, spreadsheets, and updated municipality information to EPA for inclusion in the CWNS database.



Typical wastewater projects annotated include wastewater treatment plan upgrades, new and rehabilitated collection system upgrades, new collection systems, new and rehabilitated pump stations, and infiltration/inflow projects. New wastewater treatment plants and wastewater management district implementation costs comprised a smaller percentage of annotated projects. Need categories are Types I (Secondary Wastewater Treatment), II (Advanced Wastewater Treatment), III-A (Infiltration/Inflow Correction), III-B (Sewer Replacement/Rehabilitation), IV-A (New Collector Sewers and Appurtenances), IV-B (New Interceptor Sewers and Appurtenances), V-A (Combined Sewer Overflow Correction), and XII (Decentralized Wastewater Treatment Systems).

Stormwater Needs

Woodard & Curran reviewed RIDEM's 319 grant applications, 2004 CWNS facility fact sheets, Total Maximum Daily Load (TMDL) documents, and contacted communities and the Rhode Island Department of Transportation (RIDOT) to develop a comprehensive list of facilities and relevant documents to assess for CWNS eligibility. Identified facilities include Rhode Island municipalities and other governmental and quasi-governmental entities.

As part of a comprehensive approach, we first identified eligible projects through review of stormwater management plans and feasibility studies, project priority lists (PPLs), capital improvement plans, and TMDL reports available from RIDEM and RIDOT. Eligible projects include those that have a water quality or public health need, documented capital cost, and were not completed prior to 2012.

The project team developed an innovative approach for documentation of stormwater needs given the lack of "typical" facility plans for stormwater. The following methodology outlines the innovative documentation approach that was approved by EPA and used to document needs for several municipal stormwater projects:

- *RIDEM has completed TMDLs addressing water quality impairments (mostly nutrients and bacteria) impacting the use of 117 water bodies. Most TMDLs have Waste Load Allocations (WLAs) for NPDES permitted stormwater. These TMDLs establish the stormwater need.*
- *The TMDLs typically require both modifications to the MS4 Operators' six minimum measures and structural controls within the catchment areas of priority outfalls to meet the TMDL target. Many of the TMDLs identify specific priority outfalls requiring controls. "Priority discharges" are discrete outfalls or other conveyances that are identified as being significant contributors to the identified impairment. Given the significance of uncontrolled stormwater discharges to water quality impairments in Rhode Island, the state's TMDL implementation strategy is based on controlling these priority discharges.*
- *Some municipalities in Rhode Island have begun developing TMDL Implementation Plans. These Plans identify actions and schedules to address the suite of non-structural and structural BMPs required by the TMDL. Relative to requirements for structural controls at priority discharges, the TMDL Implementation Plans typically identify the need for more detailed catchment area analyses or site specific planning studies, and do not themselves identify the specific suite of BMPs recommended to meet the TMDL target.*
- *Because Rhode Island's MS4 Operators' TMDL Implementation Plans do not include a specific suite of BMPs recommended for implementation to meet the TMDL target, or the associated costs, Rhode Island chose to use an innovative documentation method to estimate the cost of implementing TMDLs.*



- *Rhode Island's innovative documentation is based on the concept that most of the state's TMDLs require that stormwater related pollutant loads be mitigated by implementing both non-structural and structural BMPs. Rhode Island's Stormwater Manual notes that structural BMPs properly designed to capture and treat runoff can be expected to achieve certain ranges of pollutant removal efficiencies (expressed as percentages of pollutants removed), thereby establishing the basic relationship between capturing runoff and removing pollutants. The requirement to design and construct BMPs to capture and treat runoff is consistent with Rhode Island's stormwater regulations and its NPDES permits, and it is accepted as a standard method for complying with TMDL WLAs for stormwater.*
- *The major assumption for Rhode Island's innovative documentation method is the cost of treating priority discharges can be calculated by determining the volume of runoff treated and multiplying by the average cost per cubic foot of stormwater treated.*
- *Rhode Island's Stormwater Manual has established a requirement that BMPs be designed to treat the 'water quality volume' which is defined as the amount of stormwater runoff from any given storm that must be captured and treated to remove a significant fraction of stormwater pollutants on an average annual basis and is equivalent to the runoff associated with the first 1.2 inches of rainfall over the impervious surface (i.e., 1 inch of runoff). This requirement results in the capture and treatment of the entire runoff volume for 90 percent of the average annual storm events. The volume of stormwater that must be treated to address TMDL requirements is represented by the water quality volume (1 inch of runoff) of impervious surfaces in the catchment areas of priority outfalls.*
- *The extent of impervious cover to be "treated" must be determined on a case-by-case basis for each TMDL depending on the amount of pollutant load reduction required and expected pollutant removal efficiency of accepted BMPs. In the example template document we submitted to EPA, the phosphorus load reduction required to meet the TMDL was 65 percent. Because structural BMPs remove on average 50-80 percent of total phosphorus, it can be assumed that in this case, 100 percent of developed lands (impervious surfaces) in the watershed need to be treated to meet the TMDL. The large pollution load reduction required in most TMDLs combined with the median pollutant removal efficiency justifies the use of 100 percent of impervious surface within the catchment area of priority discharges as the basis for determining the volume of runoff to be treated. Given that the median pollutant removal efficiency of approved BMPs for bacteria range from 60-95 percent and that many TMDLs require greater than 50 percent reduction in bacteria levels, it may also be justified that the stormwater volume treated be based on 100 percent of impervious surfaces in these situations.*
- *The cost per cubic foot to treat the required "water quality volume" of stormwater is based on BMPs implemented in Rhode Island and the volume of runoff they treat. The average cost of the BMPs that have been implemented in Rhode Island is \$12 per cubic foot of stormwater treated. We included this in a table with the template documentation.*
- *In summary, multiplying the impervious area that must be treated for each priority discharge drainage area (in acres) by the 1 inch rainfall retention requirement gives you the number of cubic feet of runoff that must be treated (the water quality volume). Multiplying the water quality volume by the \$12 per cubic foot cost to treat the stormwater through structural BMPs, gives the cost for treating that priority discharge to meet the TMDL. We developed a cost for meeting the TMDL by adding the costs for all of the priority discharges together.*

The innovative documentation approach is contingent upon prior development of specific catchment areas for the TMDL-identified priority discharges. Of the RIDEM TMDLs, only one had catchment areas defined as



a part of the TMDL process. At the current time, it appears that RIDEM primarily develops concentration-based TMDLs which do not require development of catchment areas. In some cases, other planning documents from municipalities or state agencies were used to define catchments for priority discharges.

Woodard & Curran annotated the location, need, solution, cost, cost type, and CWNS identification numbers for documents with eligible projects. Annotated documents and summary spreadsheets for each facility were provided to LimnoTech for a final review and additional annotations. LimnoTech provided documents, spreadsheets, and updated municipality information to EPA for upload into the CWNS database.

Typical stormwater projects annotated include quality management upgrades, green infrastructure, and stormwater management program development and implementation. Need categories are Types VI- A (Stormwater Conveyance), VI-B (Stormwater Treatment), VI-C (Green Infrastructure), and VI-D (Stormwater Management Programs).

Facilities with No Needs

Table 2 is a list of 21 2004 CWNS facilities that did not have documented needs for the 2012 CWNS. Facility projects were either completed or no reports with documented costs were available.

Table 2 – Facilities with No Needs

CWNS Facility Number	Name
4400001007	Barrington Salt Storage Facility
44000003003	Burrillville Salt Pile Enclosure
44000004001	Central Falls
44000040001	City of Providence Collection System
44000005005	Coventry Salt Storage Facility
44000007001	Cumberland Sewer System
44440009002	East Providence – Bucklin Point Sewers
44440002301	Foster On Site Management
44000041001	Glocester Collection System
44000038001	Hope Valley Wastewater District
44000010002	Jamestown ISDS
44000013006	Middletown Salt Pile Enclosure
44000015004	Newport Salt Storage
44000018001	North Providence Collection System
44000020001	Pawtucket
44999999999	Rhode Island Bristol County Cesspool Phaseout
44000039001	Richmond Wastewater Management District
44440002105	Scituate On Site Management
44000025002	Town of Tiverton
44000027004	Warwick On Site Rehabilitation
44000029004	Westerly Septic System Repair Program

Recommendations

Recommendations for RIDEM include the following:

- For wastewater needs, it would be beneficial for RIDEM to require that facilities plans describe the water quality need for each referenced project. In particular, the need for new wastewater collection systems or sewer extension projects can be difficult to justify if a water quality need is not explicitly stated. Most of the facilities plans did not have an explicitly stated need such as failing septic systems. EPA does not consider future growth as an eligible need.



- For the 2016 CWNS, the CS-5 Water Development Project identified in the East Providence Facility Plan should be reviewed to verify if an eligible wastewater need exists.
- For wastewater (or stormwater) facilities plans and other RIDEM reviewed documents, we recommend that RIDEM require these documents be consistent with the SRF reporting needs. Consistency across documents would improve efficiency of documentation and completeness of the CWNS. Specifically, we recommend that each planning document contain a section or form that itemizes the information needed by the CWNS in a readily retrievable format:
 - Description of problem(s) and need(s)
 - Location of problem(s)
 - Solution of problem(s) (specific plan)
 - Cost of solution(s)
 - Basis of the cost
 - Total cost
 - Other documentation supporting needs and costs
- For stormwater needs, specific delineation of catchment areas discharging runoff to TMDL identified priority outfalls would allow the State of Rhode Island to more fully document future stormwater treatment needs. It is our understanding that the delineation of catchment areas of priority discharges (and all stormwater discharges) is a requirement under NPDES municipal stormwater permit required TMDL implementation plans. At this time, it did not appear that many submitted TMDL Implementation Plans contain catchment delineation. RIDEM may consider working with municipalities to help define catchment areas to improve documentation of stormwater needs.
- For stormwater needs, if RIDEM continues to support development of municipal stormwater utility feasibility studies, all costs identified in these studies should clearly indicate whether they are expected to be annual or ongoing costs and should account for inflation and cost of living increases. These studies should also clearly discriminate between existing or new debt and capital projects. The wording of “debt service” in both existing stormwater utility feasibility studies (Middletown and Westerly) prevented the documentation of stormwater needs for capital projects to be funded through municipal borrowing.

Sincerely,
WOODARD & CURRAN INC.

Handwritten signature of Zachary L. Henderson in black ink.

Zachary L. Henderson
Project Scientist

Handwritten signature of Bridget M. Zwack in blue ink.

Bridget M. Zwack, P.E.
Project Engineer

ZLH/bmz
224755

cc: Tim Schmitt, LimnoTech
Janelle Bonn, Woodard & Curran
Robert Rafferty, Woodard & Curran

Table 1 - 2012 Rhode Island CWNS Summary of Needs
(Adapted from EPA's Final CWNS Summary)

FACILITY	NAME	COUNTY	WATERSHED	PERMIT	TOTAL I-VI-X	I	II	III-A	III-B	IV-A	IV-B	V-A	V-B	VI	VI-A	VI-B	VI-C	VI-D	VIII	IX	X	XII	XIII
4400001001	BARRINGTON COL SYS	Bristol	Narragansett		\$ 2,079,154	\$ -	\$ -	\$ 990,073	\$ 1,089,081	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400002001	Burrillville Sewer Commission	Providence	Blackstone	RI0100455	\$ 15,623,358	\$ 148,511	\$ 4,683,047	\$ -	\$ 495,037	\$ 8,910,660	\$ 1,386,103	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400005001	COVENTRY SEWER SYS.	Kent	Narragansett		\$ 61,205,751	\$ -	\$ -	\$ -	\$ 742,155	\$ 39,652,214	\$ 20,811,382	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400005002	Coventry ISDS	Kent	Narragansett		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400006001	Veolia Water - Cranston WPCF	Providence	Narragansett	RI0100013	\$ 56,672,313	\$ 11,200,479	\$ 33,238,676	\$ -	\$ 708,021	\$ 11,525,137	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400008001	EAST GREENWICH STP	Kent	Narragansett	RI0100030	\$ 4,554,337	\$ 1,980,147	\$ -	\$ 396,029	\$ 1,584,117	\$ 594,044	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400009001	East Providence WPCF	Providence	Narragansett	RI0100048	\$ 10,165,060	\$ 10,165,060	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400010001	Jamestown WWTF	Newport	Narragansett	RI0100366	\$ 370,533	\$ -	\$ -	\$ -	\$ 370,533	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400011001	JOHNSTON COLL SYS	Providence	Narragansett		\$ 93,388,650	\$ -	\$ -	\$ 543,554	\$ 2,340,303	\$ 63,480,587	\$ 27,024,206	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400012001	LINCOLN COLL. SYS.	Providence	Narragansett		\$ 2,121,796	\$ -	\$ -	\$ 130,474	\$ 1,991,322	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400013001	MIDDLETOWN COL SYS	Newport	Narragansett		\$ 11,740,886	\$ -	\$ -	\$ 11,072,947	\$ 667,939	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400014001	NARRAGANSETT SCARBOROUGH	Washington	Narragansett	RI0100188	\$ 27,534,411	\$ 7,214,019	\$ -	\$ 197,908	\$ -	\$ 20,122,484	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400014002	Narragansett- SK Regional Sewers	Washington	Narragansett		\$ 1,682,217	\$ -	\$ -	\$ 197,908	\$ 1,484,309	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400014003	Town of Narragansett Stormwater	Washington	Narragansett	RIR040026	\$ 1,754,188	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400015001	NEWPORT WWTF	Newport	Narragansett	RI0100293	\$ 26,222,797	\$ 7,916,316	\$ -	\$ -	\$ 18,306,481	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400015003	City of Newport Stormwater	Newport	Narragansett	RIR040009	\$ 742,155	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400016001	New Shoreham WWTF	Washington	Narragansett	RI0100196	\$ 2,231,351	\$ 877,550	\$ -	\$ -	\$ 288,839	\$ 1,064,962	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400017001	N KINGSTOWN COLLECTION SYSTEM	Washington	Narragansett		\$ 86,829,435	\$ -	\$ -	\$ -	\$ 1,188,088	\$ 45,246,353	\$ 40,394,994	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400019001	N SMITHFIELD COL SYS	Providence	Blackstone		\$ 34,101,169	\$ -	\$ -	\$ -	\$ 33,199,692	\$ 901,477	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 99,231
4400021001	Portsmouth North End and West Side	Newport	Narragansett		\$ 81,646,929	\$ 11,135,989	\$ 11,135,989	\$ -	\$ -	\$ 58,926,235	\$ 448,716	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400021002	Portsmouth - ISDS	Newport	Narragansett		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400022001	FIELDS POINT WWTF	Providence	Narragansett	RI0100315	\$ 292,411,767	\$ 30,269,935	\$ 27,859,877	\$ 4,487,252	\$ 15,081,242	\$ -	\$ 214,713,461	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 132,739
4400023001	Smithfield Sewer Authority	Providence	Narragansett	RI0100251	\$ 33,219,707	\$ 990,073	\$ 7,296,841	\$ 1,636,367	\$ -	\$ 23,296,426	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400024001	SOUTH KINGSTOWN REG STP	Washington	Narragansett	RI0100374	\$ 43,684,221	\$ 12,344,312	\$ -	\$ 197,524	\$ -	\$ 26,340,898	\$ 4,801,487	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400025001	TIVERTON SEWERAGE	Newport	Narragansett		\$ 14,415,468	\$ -	\$ -	\$ -	\$ 14,415,468	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400026017	Rhode Island Airport Corporation	Kent	Narragansett		\$ 24,782,364	\$ 12,391,182	\$ -	\$ -	\$ -	\$ 12,391,182	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400027001	WARWICK WWTF	Kent	Narragansett	RI0100234	\$ 83,639,179	\$ 5,588,651	\$ 13,853,553	\$ -	\$ 10,288,346	\$ 26,657,453	\$ 27,251,176	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400027010	Warwick Stormwater Abatement	Kent	Narragansett	RIR040031	\$ 9,551,287	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,283,304	\$ -	\$ -	\$ 4,267,983	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400028001	West Warwick WWTF	Kent	Narragansett	RI0100153	\$ 21,826,281	\$ -	\$ 15,544,152	\$ 495,037	\$ 5,787,092	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400029001	Westerly WWTF	Washington	Pawcatuck-Wood	RI0100064	\$ 121,322,699	\$ 8,048,181	\$ -	\$ -	\$ 5,365,454	\$ 53,954,532	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400030001	WOONSOCKET REGIONAL WWTF	Providence	Blackstone	RI0100111	\$ 44,529,278	\$ 22,264,639	\$ 22,264,639	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400031001	BUCKLIN PT STP	Providence	Narragansett	RI0100072	\$ 650,740,387	\$ 2,922,689	\$ 42,322,201	\$ 677,582	\$ 2,580,935	\$ -	\$ 602,236,980	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400034001	ZAMBARANO HOSPITAL	Providence	Blackstone	RI0100129	\$ 330,832	\$ -	\$ 330,832	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4400042001	QUONSET POINT WWTF	Washington	Narragansett	RI0100404	\$ 4,950,367	\$ 4,950,367	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44000260011	WARREN WWTF	Bristol	Narragansett	RI0100056	\$ 2,365,324	\$ 930,492	\$ -	\$ -	\$ 1,434,832	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 140,134
44000260016	Town of Warren Stormwater	Bristol	Narragansett	RIR040003	\$ 1,748,896	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,748,896	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44060001001	Town of Barrington Stormwater	Bristol	Narragansett	RIR040022	\$ 1,682,507	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,485,110	\$ -	\$ 197,397	\$ -	\$ -	\$ -	\$ -
44060006001	Cranston Stormwater Needs	Providence	Narragansett	RIR040012	\$ 8,666,160	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 494,770	\$ -	\$ 8,171,390	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44060008001	East Greenwich Stormwater	Kent	Narragansett	RIR040002	\$ 2,340,620	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,277,169	\$ -	\$ 63,451	\$ -	\$ -	\$ -	\$ -	\$ -
44060013004	Town of Middletown Stormwater Management	Newport	Narragansett	RIR040032	\$ 2,840,421	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,125,109	\$ -	\$ 715,312	\$ -	\$ -	\$ -	\$ -	\$ -
44060018001	North Providence Stormwater Management	Providence	Narragansett	RIR040007	\$ 295,275	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 178,117	\$ 117,158	\$ -	\$ -	\$ -	\$ -	\$ -
44060024001	South Kingstown Stormwater Needs	Washington	Narragansett	RIR040037	\$ 16,720,252	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,232,142	\$ 6,564,959	\$ 4,923,151	\$ -	\$ -	\$ -	\$ -	\$ -
44060028001	West Warwick Stormwater Management	Kent	Narragansett	RIR040015	\$ 1,323,456	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,255,775	\$ 67,681	\$ -	\$ -	\$ -	\$ -	\$ -
44060029001	Westerly Stormwater Management	Washington	Pawcatuck-Wood	RIR040014	\$ 3,331,101	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,269,010	\$ 1,125,491	\$ 411,371	\$ 525,229	\$ -	\$ -	\$ -	\$ -	\$ -
44060040001	City of Providence Stormwater - Mashpaug TMDL	Providence	Narragansett	RIR040005	\$ 2,651,803	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,651,803	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44060040002	Providence Stormwater Management	Providence	Narragansett	RIR040005	\$ 3,171,018	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 179,552	\$ 2,991,466	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44060041001	Town of Glocester Stormwater	Providence	Blackstone	RIR040038	\$ 1,025,276	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 247,518	\$ -	\$ 619,052	\$ 158,706	\$ -	\$ -	\$ -	\$ -	\$ -
44060043001	Charlestown Stormwater Management	Washington	Pawcatuck-Wood	RIR040040	\$ 465,563	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 209,387	\$ 256,176	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44440002001	BRISTOL WWTF	Bristol	Narragansett	RI0100005	\$ 6,926,777	\$ 2,473,849	\$ -	\$ 1,979,079	\$ 2,473,849	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44999999995	Rhode Island Washington County Cesspool Phaseout	Washington	Pawcatuck-Wood		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,142,611
44999999996	Rhode Island Providence County Cesspool Phaseout	Providence	Blackstone		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 59,689
44999999997	Rhode Island Newport County Cesspool Phaseout	Newport	Narragansett		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,140,264
44999999998	Rhode Island Kent County Cesspool Phaseout	Kent	Narragansett		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 451,928
Totals					\$ 1,921,624,776	\$ 153,812,441	\$ 178,529,807	\$ 23,709,755	\$ 85,085,091	\$ 415,862,008</													