



Review of Stormwater Fee Implementation in  
Portland, Maine

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on behalf of

Casco Bay Estuary Partnership

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## Table of Contents

|   |       |
|---|-------|
| Executive Summary .....   | 3     |
| Background .....  | 3-4   |
| Allocation of Funds .....   | 5-10  |
| Allocation of Stormwater Credits .....                            | 10-11 |
| Water Quality Benefits of Projects Funded by Stormwater Fee ..... | 11    |
| Observations and Recommendations .....                            | 11-12 |
| Appendix 1 – Sources .....  | 13    |
| Appendix 2 – List of Interviewees .....                           | 14    |

## **Executive Summary**

This report was commissioned by Casco Bay Estuary Partnership (CBEP), at the University of Southern Maine (USM). CBEP's mission is to help conserve the ecological integrity of Casco Bay and its watershed through science, public stewardship and effective management. In support of that mission, CBEP is monitoring the implementation of Portland's Stormwater Service Charge ("Stormwater Fee"), including reviews of the costs and benefits of projects funded by the stormwater fee. This report presents a snapshot of stormwater initiatives. Readers interested in learning more about current and past stormwater activities should visit the city's website, which provides links to plans and reports with more information on stormwater activities (<https://www.portlandmaine.gov/1835/Reports-and-Assessments>).

In 2016, after years of study and preparation, Portland enacted a stormwater service fee designed to raise an estimated \$170 million over 15 years to properly fund projects and initiatives mandated under the federal Clean Water Act. Under the Clean Water Act, Portland must evaluate and prioritize stormwater pollution problems from combined sewer overflows (CSO) and from untreated stormwater, and develop cost-effective solutions to reduce pollution from stormwater. This is not an insignificant task as the city manages 107 miles of sanitary sewer pipe, 120 miles of stormwater sewer pipe, 120 miles of combined pipe, nine wastewater pump stations, and 15,000 storm and sewer manholes and catch basins.

This report focuses on three areas: (1) allocation of funds collected as part of the fee; (2) allocation of stormwater credits, and (3) water quality benefits of projects funded by the stormwater fee. Overall, the city's stormwater fee seems to be running well, with a relatively low number of telephone calls regarding implementation, and relatively few lien fees. However, it is unclear whether residents and businesses understand and appreciate the link between the fee and stormwater runoff, and how they both relate to clean water. Continuation of outreach efforts of various sorts would help to bridge this gap. It is also too early to review monitoring data to measure water quality improvements resulting from improvements funded by this stormwater fee. Portland's integrated water resources plan will link sampling data to stormwater improvements, and post-construction monitoring of stormwater will provide additional data on the link between water quality and stormwater best management practices.

## **Background**

Portland created the "Sustainable Stormwater Funding Task Force" in 2011 to examine challenges associated with managing stormwater runoff. Its purpose was to find a more equitable system of paying for stormwater management by tying it to its principal cause: impervious surfaces.

Both runoff volumes and the level of pollutants found in stormwater are closely related to the amount of impervious surface (roads, rooftops, and parking areas) that exists on a parcel of land. In the absence of a stormwater fee, some properties that contributed disproportionately to stormwater runoff, such as commercial parking lots, paid a small or no sewer bill, and thus did not contribute their fair share of the cost. Conversely, residents and businesses that used a lot of water without generating a proportional amount of wastewater, such as breweries, were paying more than their fair share.

The Task Force studied funding alternatives to operate, maintain, and meet the capital costs of Portland’s stormwater and combined sewer systems. The recommendation was to enact a fee that would cover the entire cost of the stormwater system, plus half the cost of the combined sewer system, with the other half to be paid by the existing wastewater fee. This new arrangement shifts more of the burden of paying for Portland’s stormwater system onto those who generate the most runoff and thus implicitly use it the most.

On January 1, 2016, Portland implemented the stormwater service fee, thereby creating a dedicated funding stream to pay for the city’s stormwater management programs. The rate started at \$6.00 per 1,200 square feet of impervious surface, and then rose to \$6.30 on July 1, 2018. The city uses several methods, including satellite imagery, to estimate each property’s impervious surface.

In recent decades, communities across the United States have created similar utilities to collect and manage the resources required to manage stormwater runoff. While these institutions are common in other parts of the U.S., relatively few are in New England (Figure 1). Like any other utility such as electricity or sewer, stormwater fees reflect the cost of providing a service, in this case, the service of managing stormwater runoff to minimize flooding and protect human health and the environment. By aligning the fee with a specific property’s impervious service, the city can more fairly allocate the cost of service among its users. Cities can thereby plan for the long term, base costs on actual service provided (in other words, the service provided by managing a property’s runoff), and offer credits to create incentives for property owners to mitigate the amount of runoff produced by their property.

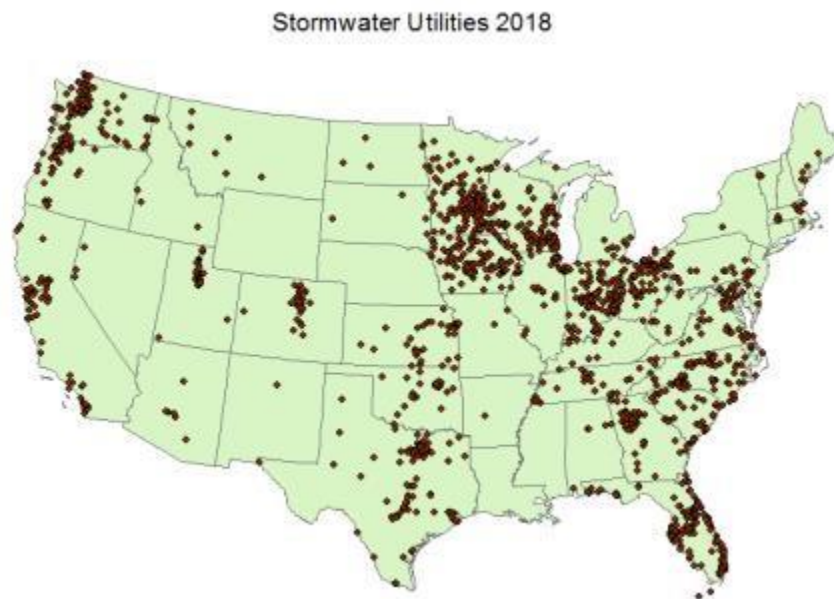


Figure 1 – Stormwater utilities across the country. Source: University of Western Kentucky 2018 Stormwater Utility Survey

## I. ALLOCATION OF FUNDS

[Information for this section comes from the city of Portland's [Comprehensive Annual Financial Reports](https://www.portlandmaine.gov/Archive.aspx?AMID=37) (<https://www.portlandmaine.gov/Archive.aspx?AMID=37>) for the 2017 fiscal year ending June 30, 2017, and for the 2016 fiscal year ending June 30, 2016.]

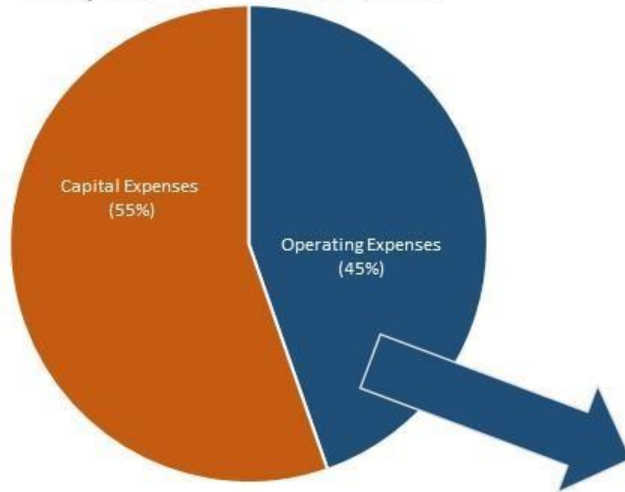
The inception of the stormwater fee began halfway through fiscal year 2016 and brought in approximately \$3.3 million from January to June of 2016. For fiscal year 2017, the city collected approximately \$6.5 million in revenue through the fee. In fiscal year 2016, operating expenses were \$2.1 million, and capital expenses were \$3.4 million—this latter amount was transferred from the city's Stormwater account to the Sewer Fund to pay for a portion of existing debt obligations incurred to the city's combined sewer overflow (CSO) system. For fiscal year 2017, operating expenses were about \$1.8 million, which went towards expenses such as personnel and contractual services (see full breakdown in the graphic). Capital expenses were about \$2.2 million, of which about \$1 million was transferred from the city's Stormwater account to the Sewer Fund, a much smaller amount than the previous year. In FY 2017, the program spent approximately \$4 million, yielding a positive net position of approximately \$2.4 million.

Since inception in January 2016, proceeds from stormwater funds have been used for:

- Capital improvements: sewer separation projects, underground storage tanks to hold the first flush of stormwater until storms subside, and "green infrastructure" installations that use soil media and plants to absorb stormwater runoff before it enters the sewer system or adjacent water bodies.
- Public education and public outreach: efforts to increase the public's awareness of their impact on the health of Casco Bay. Staffing resources to respond to questions and concerns about the fee.
- Maintenance: equipment such as street sweepers; several staff positions to clean and maintain storm sewers, catch basins and retention ponds, as well as keep roads swept and clean.
- Oversite of Impervious Surface Credit Program: staff to manage the GIS impervious surface calculations and its credit system for qualified improvements that reduce the impact of the property's impervious surface and thereby reduce the city's cost of providing service.
- Management of the Municipal Separate Storm Sewer System (MS4) program: City-wide compliance with EPA's MS4 Program (GIS Mapping, Integrated Plan, Public Outreach, wet weather and dry weather inspections, response to Illicit discharges, spill protection and cleanup as well as proper use of drainage).
- Finance and IT Administration: staff to administer the stormwater fee program. The Customer Service Specialist responds to questions and concerns about the fee, and provides information to the public. Accountants ensure that the stormwater fee is accounted for appropriately in the city's financial system. The city's Water Resources Manager oversees all aspects of the city's water programs, including the mandatory Stormwater Management Program.

In FY2016, approximately \$1.2 million was used for staff including 11 Full Time Equivalent (FTE) employees. Only four positions (Stormwater Coordinator, Supervisor, Assistant Engineer, and Customer Service Specialist) were fully funded by the fee. Overall, a combination of stormwater fee and other city funds paid for approximately four dozen positions, including Water Resource Manager, Sewer Inspector, Maintenance Workers, Technicians, and Accountants. In FY2017, the stormwater fee funded the salaries and benefits of eight full-time staff: Stormwater Coordinator, Project Engineer, Foreman, and five Maintenance workers. In addition, the stormwater fund paid for half of the following personnel: Water Resource Manager, Compliance Section Coordinator, Asset and Information Management Specialist, Asset Management Tech, Programmer Analyst, and Project Engineer. In all, the city spent just shy of \$1 million on personnel in FY17.

## Stormwater Activities July 2016 – June 2017



|                    |                    |
|--------------------|--------------------|
| Operating Expenses | \$1,819,843        |
| Capital Expenses   | \$2,255,894        |
| <b>Total</b>       | <b>\$4,075,737</b> |

### Breakdown of Operating Expenses

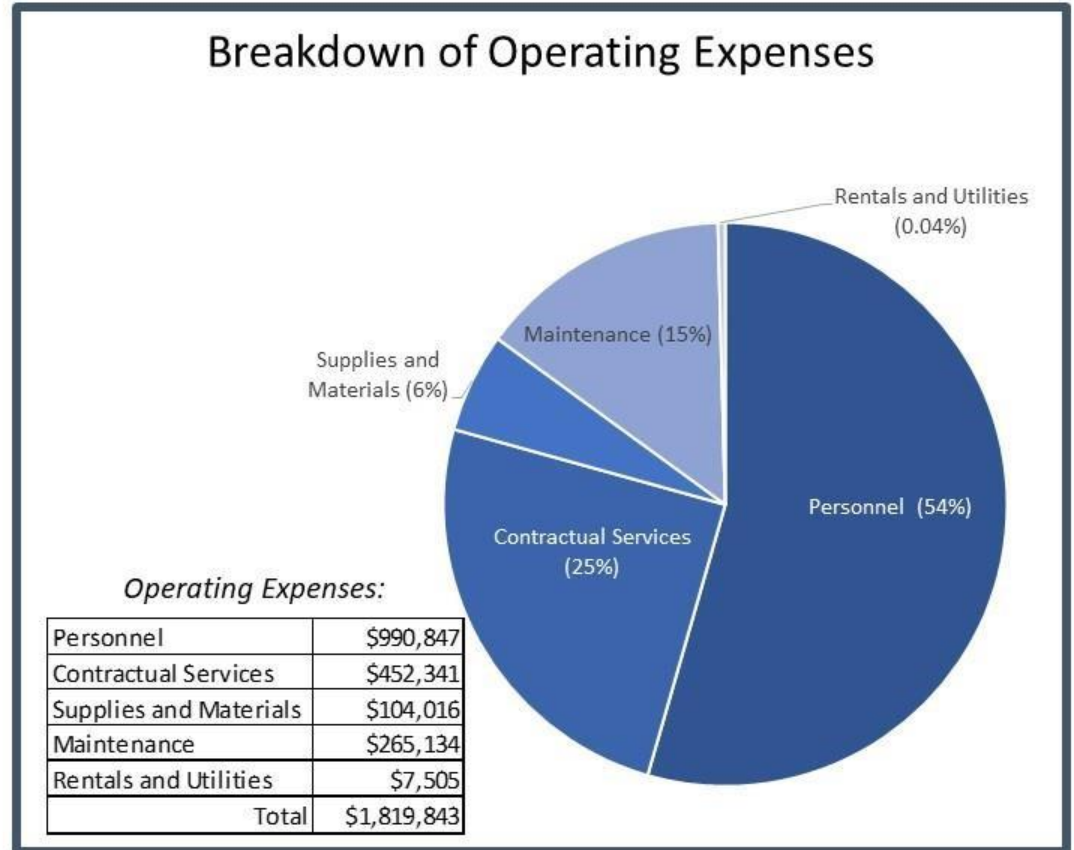


Figure 2 --Stormwater Fee Allocation (Source: FY2017 Comprehensive Annual Report)

## CAPITAL IMPROVEMENTS

### **Large Infrastructure Projects**

#### Back Cove Projects

The city installed two tanks, one under Baxter Boulevard and the other under Payson Park, which can each hold up to one million gallons of sewage and stormwater, to prevent overflow from reaching Back Cove. During a storm, the tanks hold excess water until the sewer system can send it to the East End Wastewater Treatment Facility. These large infrastructure projects were procured through public bonds and are being serviced equally by the city's stormwater fee and sewer fee. The proceeds of the stormwater fee are being used to pay back the associated debt obligations for these capital investments.

#### Capisic Brook Projects

Projects to improve stormwater in the *Capisic Brook* watershed take priority because it is classified by the Maine Department of Environmental Protection (MEDEP) as "impaired." Capisic Brook does not meet water quality standards for its water quality classification (Class C Water) and does not support Class C habitat. Since the brook's water quality impairment is not due to a single pollutant, but rather several pollutants affiliated with stormwater runoff, the DEP has developed a Total Maximum Daily Load (TMDL) for Impervious surface in the Capisic Brook Watershed. MEDEP has estimated that to meet Class C water quality, the brook needs the characteristics of a watershed that has only 14% impervious surface. Currently, the Capisic Brook watershed has 31% impervious surface. Portland has developed a remediation plan to restore the watershed's health.



*Sagamore Village* is a 350-unit affordable housing community located within the Capisic Brook watershed. Proceeds from the stormwater fee have been used to install green infrastructure, specifically a **bioretention basin** and **tree box filters**, to mitigate stormwater runoff into the watershed.

*An example of a tree box filter in the Back Cove neighborhood  
(credit: Nancy Gallinaro)*

Also within the Capisic Brook watershed, the city installed constructed **gravel wetlands**, which will prevent stormwater runoff from discharging into open water. The city purchased 42.5 acres of wooded land to protect the watershed and allow its natural landscape the opportunity to naturally absorb stormwater and improve water quality.



*Gravel Wetlands at Capisic Brook  
(credit: Nancy Gallinaro)*



### Woodford Street and Woodford Corner Separation Project

Portland and the Maine Department of Transportation (MDOT) shared the cost to construct a separated stormwater system located under Woodford Street that discharged at the shoreline of Back Cove. The project consisted of 2,000 feet of storm drain pipe and 1,000 feet of sewer replacement pipe, a Baffle Box to separate out sediment, and an outfall located at Back Cove. Backflow preventers were installed on the storm drain to prevent high tides from entering the baffle box, resuspending sediment, and allowing sediment to be released.



Woodford Street (photo credit: Nancy Martin)

### Deering Street Sewer Separation Project

In 2017, Portland wrapped up its project of separating the existing combined sewer in the street into a separate sanitary sewer and a separate stormwater drain.

## **Routine Infrastructure Projects**

### Neighborhood Stormwater Drainage

Proceeds from the stormwater fee were used to respond to specific homeowner requests. Examples of this service often include the remediation of culverts overflowing onto residential properties.

## PUBLIC EDUCATION AND OUTREACH

Portland is committed to transparency and making information accessible to the public. City staff have created tools for residents to learn more about the stormwater program through the city's website. Residents can calculate their own stormwater service charge, read the credit manual, see a list of green infrastructure projects that reduce runoff and improve water quality, and even find the location of the city's street sweepers in near-real time, using GIS capability on the vehicles.

As part of its Stormwater Management Plan, Portland must fulfill requirements for public outreach and education. In FY 2017, as in other years, this work was facilitated by the Cumberland County Soil and Water Conservation District (CCSWCD), which coordinated a statewide television and online media campaign, helped promote the Urban Runoff 5K, and promoted a Green Neighbor Family Festival. The sixth annual Urban Runoff and Family Fest was held on April 22, 2017 and promoted clean water and raised awareness of water pollution. In addition, the Interlocal Stormwater Working Group (ISWG) provided outreach and education to area youth through school programs, reaching over 3,000 students. Students did activities such as clean-up and stenciling of storm drains to indicate that they flow to Casco Bay. These activities all serve to increase public awareness about the benefits of programs funded by the stormwater fee. Other public outreach initiatives include bill stuffers, adult education classes, working with retail establishments to provide information on healthy lawn care, and targeting neighborhoods in priority areas about the importance of clean stormwater via direct mail, neighborhood canvassing, and social media.

## MAINTENANCE

As the city increasingly uses porous pavement, debris must be vacuumed off the pavement for it to perform as intended. Maintenance workers, using high efficiency street sweepers and vacuum sweepers (see photos) clear 4,000 tons of sand and other debris from city streets every year. This debris would otherwise either clog catch basins or pollute local waters. Vacuum trucks are used to clean out catch basins, and workers maintain city-owned stormwater and green infrastructure installations to ensure they work as designed. Examples of green infrastructure include: two rain gardens at Back Cove and rain gardens on Hersey, Codman, Chenery, and George Streets; Filterra units on Macworth and Austin Street; a gravel wetland at Lyman Moore Middle School; rain garden, green roof, porous pavers and asphalt at the Ocean Avenue Elementary School, and bioretention cells.



*Photos credit: John Emerson*

## **II. ALLOCATION OF STORMWATER CREDITS**

Stormwater credits are available for improvements that mitigate the effect that impervious surface has on stormwater runoff. Credits are available for two categories of property improvements: those that improve runoff *quality*, and those that reduce runoff *quantity*. The stormwater fee for residential properties can be reduced if the owner installs any of the following: cisterns, dry wells, modified French drains, permeable pavers (also called porous pavement), and rain gardens. Non-residential property owners can apply for basic credits, extra credits, minimum standard credits, and Independent Stormwater Fee Credits.

Credits are based on the standards laid out by the Maine Department of Environmental Protection (MEDEP) in the Chapter 500 Rules of its [Stormwater Program](#). For both residential and non-residential properties, the size of the credit is based on the amount of impervious surface that receives additional treatment and the quality of that treatment. The property owner must go through an application process, maintain the stormwater controls, and submit to periodic inspections by the city. In the first year and a half of the program's operation, a total of 77 credit applications were submitted for residential and non-residential properties. Of the 39 residential applications, 20 were approved. The value of approved residential credits in the first six months of the stormwater fee's operation was \$1,368. Most of the residential credit applications were submitted between December 2015 and June 2016, and applications have slowed since then.

Non-residential credits, mostly applied for by large commercial properties, are a larger component of the overall credit program. The total value of non-residential credits granted was \$75,240, reflecting 33 approved applications (out of 38 applications). Many of these credits were granted for stormwater systems that were already required by either the State of Maine and/or the city of Portland. These include bio retention cells (such as large-scale rain gardens), detention ponds, and under drained soil filters.

When the city requires projects to have post-construction inspections of stormwater systems, owners can hire a third-party inspector or conduct self-inspections of stormwater treatment. When no third party is hired, the city schedules inspections. Owners can apply for a credit if they provide proof that the annual inspection and maintenance requirements occurred. In June 2016, approximately 75 annual inspection report reminder letters were sent to property owners along with information on the stormwater credit program. The mailing resulted in 26 documented inspections and numerous inquiries. In May 2017, 127 reminders were sent, again with information on the credit. The results were 57 documented annual reports being turned in. These numbers illustrate the ability of the City to use the stormwater fee as a leveraging tool to improve documented inspection and maintenance of privately owned stormwater treatment systems.

As of July 30, 2018, the total annual value of approved credits for FY19 was \$85,730, approximately \$84,000 of which is for commercial buildings.

### **III. WATER QUALITY BENEFITS OF PROJECTS FUNDED BY THE STORMWATER FEE**

The city has allocated highly qualified staff and sufficient funding to properly run the program, educate the public, and minimize the amount of stormwater runoff entering open water. It is difficult to ascertain at this early stage how the health of Portland's local waters can be attributed to projects funded by the stormwater fee. However, *Portland has steadily reduced combined sewer overflow volumes and increased the number of green infrastructure projects the city has implemented over the past 20 years.*

### **IV. OBSERVATIONS AND RECOMMENDATIONS**

Portland is one of just five stormwater utilities in the state of Maine. Other communities are looking to Portland to see how successful this program will be. It is therefore of the utmost importance to make this program as understandable to the public as possible to ensure its long-term support and success. The extent to which residents understand and appreciate the link between the stormwater fee and stormwater runoff, and how both relate to clean water, is not clear.

The city undertook significant public outreach to sensitize the community before launching the stormwater fee. There were focus groups, presentations to key stakeholders, and coordination with local press. The stormwater program also instituted a quarterly newsletter that, according to their website, accompanies stormwater bills in the months of January, April, July, and October. Currently there are only two newsletters available on the city's website, from October 2017 and January 2018.

The City received over 1,000 calls prior to and during the first several months of implementation of the stormwater fee, but the number has tapered off. Fewer calls indicate that the public is more aware, less confused and/or more accepting of the stormwater fee and what it funds. For its first year of operation, payment rates were high and non-compliance relatively low (6%). The city sent out just 1,375 lien notices in the first year out of over 22,000 registered properties. Fewer calls and high compliance rates should not result in the city assuming that acceptance of the fee can be taken for granted, however. The following public outreach initiatives have been successful and should continue:

- The newsletter is a useful tool that the city has identified to communicate with customers and educate them about the impact of their stormwater service charge and should continue.

- The newsletter or smaller inserts should regularly accompany stormwater bills and be used to educate the public on how fees are used, how extensive the system is, and upcoming events that will continue to build support for the program.
- More information on the credit program for homeowners should be considered.
- It will be important to follow payment non-compliance to see if it decreases as anticipated.

The credit program is a way to increase awareness of how impervious surface relates to stormwater runoff. It can be used as an incentive for residents, as has been done for larger commercial/industrial ratepayers. Some residents in Portland may be interested in applying for credits, but do not do so because they find the process too confusing or cumbersome. Many residents are probably unaware that a credit program exists. The following actions could lead to increased credit applications, and provide the city an opportunity to educate the public about the relationship between impervious surface and stormwater runoff, and how best to mitigate the resulting environmental impacts:

- Consider making the credit manual more accessible to residential property owners who want credits, or who simply want to reduce the environmental impact of their property.
- Continue hosting training sessions for residents where they can hear a live presentation, meet city staff, ask questions, and get clarity on what qualifies for a credit.
- Add a list of Frequently Asked Questions to the website (there currently is an FAQ related to bill payment, but apparently no FAQs for the credit program), and provide a list of approved vendors.

Water quality is already monitored by the city. Improvements to water quality that can be linked to improved infrastructure, improved maintenance, or improved behavior (by residential, industrial, and commercial users) need to be tracked and communicated to the public to increase their buy-in. The stormwater program is off to a solid start and will hopefully only improve in future years.

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**Appendix 2 – List of Interviewees**

| <b>People interviewed in 2017:</b> | <b>Title</b>                     | <b>Affiliation:</b>           |
|------------------------------------|----------------------------------|-------------------------------|
| Nancy Gallinaro                    | Water Resources Manager          | City of Portland              |
| Anne Bilodeau                      | Deputy Finance Director          | City of Portland              |
| Brendan O'Connell                  | Finance Director                 | City of Portland              |
| Jessica Gooch                      | Asset Management Technician      | City of Portland              |
| John Emerson                       | Public Works Utility Coordinator | City of Portland              |
| Justin Pellerin                    | Stormwater Project Engineer      | City of Portland              |
| Catherine Ellis                    | Customer Service Specialist      | City of Portland              |
| Curtis Bohlen                      | Director                         | Casco Bay Estuary Partnership |
| Marti Blair                        | Program Coordinator              | Casco Bay Estuary Partnership |

| <b>Input for 2018 update came from:</b> | <b>Title</b>                   | <b>Affiliation:</b> |
|---|--------------------------------|---------------------|
| Nancy Gallinaro                         | Water Resources Manager        | City of Portland    |
| Pat Handrahan                           | Principal Financial Officer    | City of Portland    |
| Doug Roncarati                          | Stormwater Program Coordinator | City of Portland    |
| Justin Pellerin                         | Stormwater Project Engineer    | City of Portland    |

*The author is grateful to these people for their help in the creation and update of this report.*