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Long Creek General Permit
Annual Report for Calendar Year 2016

Introduction and Background
This report has been prepared in fulfillment of Part IV.A of the Maine Department of Environmental Protection’s (DEP’s) General Permit – Post-Construction Discharge of Stormwater in the Long Creek Watershed, Waste Discharge License #W-9052-5Y-B-N, dated April 15, 2015 (hereinafter referred to as the “Long Creek General Permit”), which states as follows:

“Annual progress reports shall be submitted by the permittee no later than May 31st of each calendar year and will include activities of the previous calendar year. The Long Creek Watershed Management District may submit an annual report on behalf of all permittees participating in the Plan.”

Where is Long Creek?
Long Creek is a meandering urban stream system with four primary branches that converge before flowing into Clark’s Pond in South Portland, Maine. The Long Creek Watershed encompasses 3.5 square miles in a commercial/retail district located in four municipalities: Portland, Scarborough, South Portland, and Westbrook. The watershed with respective landmarks is illustrated in Figure 1.

![Figure 1 Long Creek Watershed Overview Map](image)
Why is Long Creek Regulated?

Long Creek is an urban stream system that is classified by the Maine Water Classification Program as a Class C stream.¹ Portions of Long Creek currently do not meet the water quality standards established for Class C Streams, which “must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community” according to Maine Statute (38 M.R.S.A § 465(4)(C)).

Long Creek has been the subject of many studies and reports. What the data suggests is twofold:

1. As stated in the Long Creek Restoration Project Executive Summary, “[y]ears of urbanization have significantly impaired the stream’s health, as well as its ability to support recreation and wildlife, such as brook trout.”

2. The Long Creek Watershed Management Plan (LCWMP) identified that water quality impairments are a result of increased concentrations of metals, chloride, phosphorus, nitrogen, polycyclic aromatic hydrocarbons (PAHs), and reduced dissolved oxygen (DO) concentrations.

Historically, there have been very few regulated point source discharges and other stormwater controls (i.e., water quantity and quality) in the watershed. Substantial nonpoint source discharges from the existing built environment have contributed to the degraded water quality. Increased water temperatures from lack of shading in certain areas and altered hydrological conditions have also adversely affected stream health and water quality.

In 2009, the U.S. Environmental Protection Agency (EPA) exercised its authority under a provision in the Clean Water Act, known as Residual Designation Authority (RDA), requiring a permit for the discharge of stormwater for designated discharges in the Long Creek Watershed. The EPA’s designation requires a permit for “[s]torm water discharges from properties on which there are impervious surfaces or areas equal to or greater than one acre in the Long Creek watershed.” This precedent-setting use of the RDA provision led to the establishment of the Long Creek Watershed Management District (LCWMD) to implement the LCWMP and a corresponding annual fee to fund implementation of the plan.

Impervious Cover

As defined in EPA’s designation, “impervious surface” or “impervious area” (hereinafter collectively referred to as Impervious Cover or “IC”) means:

“the total area of a parcel or right-of-way that consists of building and associated constructed facilities; areas that are covered with a low-permeability material such as asphalt or concrete; or areas such as gravel roads and unpaved parking areas that are compacted through design or use to reduce their permeability. Common impervious areas include, but are not limited to, roads, rooftops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, packed earthen materials, and macadam or other surfaces which similarly impede the natural infiltration of storm water.”

¹ Prior to 2009, a 0.3-mile segment of Long Creek in Westbrook was classified as Class B. In 2009, Maine DEP sought to reclassify this 0.3-mile segment from Class B to Class C. This reclassification was approved by the Maine legislature in 2009. See P.L. 2009, ch. 163, § 17. In correspondence to the Maine Department of Environmental Protection dated March 16, 2015, the U.S. Environmental Protection Agency disapproved the reclassification of this 0.3-mile segment of Long Creek in Westbrook from Class B to Class C. Under Maine statute, 38 M.R.S.A. § 468(1)(J), the classification of this 0.3-mile segment of Long Creek in Westbrook remains Class C.
In the Long Creek Watershed, IC is used to determine regulated discharges and assess annual fees for implementation of the LCWMP under the Long Creek General Permit. In general, IC is also used as a measure of watershed and stream health.

- Watershed size is 2,304 acres (3.5 sq. miles)
- Length of streams is approximately 10 miles
- Total IC is 668 acres (29% of watershed)
- Regulated IC is 609 acres (91% of IC in watershed)

Regulated IC includes parcels with one acre or more of IC. Parcels with <1 acre of IC are not required to obtain a permit.

Table 1 summarizes the impervious cover by subwatershed and land use.

Table 1 Impervious Cover Acreage by Subwatershed

<table>
<thead>
<tr>
<th>INDIVIDUAL SUBWATERSHEDS</th>
<th>Building (acres)</th>
<th>Parking (acres)</th>
<th>Road (acres)</th>
<th>Total IC (acres)</th>
<th>Watershed (acres)</th>
<th>Percent IC (by subwatershed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanchette Brook</td>
<td>17</td>
<td>42.2</td>
<td>17.6</td>
<td>76.8</td>
<td>431.5</td>
<td>17.8%</td>
</tr>
<tr>
<td>Main Stem</td>
<td>30.9</td>
<td>103</td>
<td>49.8</td>
<td>189</td>
<td>987.2</td>
<td>19.1%</td>
</tr>
<tr>
<td>South Branch</td>
<td>50.3</td>
<td>141.1</td>
<td>40.1</td>
<td>231.6</td>
<td>421.6</td>
<td>54.9%</td>
</tr>
<tr>
<td>North Branch</td>
<td>24.5</td>
<td>64.6</td>
<td>33.7</td>
<td>122.8</td>
<td>295.4</td>
<td>41.6%</td>
</tr>
<tr>
<td>East Branch</td>
<td>10.5</td>
<td>33</td>
<td>33.7</td>
<td>48.4</td>
<td>168.3</td>
<td>28.8%</td>
</tr>
<tr>
<td>Total</td>
<td>133.2</td>
<td>383.9</td>
<td>174.9</td>
<td>668.6</td>
<td>2,304</td>
<td>29%</td>
</tr>
</tbody>
</table>

Figure 2 depicts the subwatersheds and their respective percent impervious cover.

Figure 2 Impervious Cover by Subwatershed

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2 Acreages represented are estimated.
General or Individual Permit Requirement
Following EPA’s designation, affected landowners and operators in the Long Creek Watershed had two permitting options: (1) participate in implementation of the Long Creek Watershed Management Plan being managed by LCWMD via the filing of notice of intent to comply with the Long Creek General Permit or (2) obtain an individual permit. Individual permit holders are required to meet current stormwater management law requirements for development, as well as waste discharge requirements (i.e., Chapter 521, Section 9A standards and Chapter 529). Six landowners or operators within the universe of owners and operators of regulated IC do not participate in implementation of the LCWMP through the Long Creek General Permit and, therefore, are subject to individual permit requirements. Approximately 25.5 acres (4%) out of a total of 609.6 acres of regulated IC are managed outside of the Long Creek General Permit.

Long Creek Watershed Management Plan
Operators of properties who file a notice of intent to comply with the Long Creek General Permit are required to demonstrate that they have entered into a binding agreement with LCWMD which provides for participation in the implementation of the LCWMP. Operators that obtain permit coverage under the Long Creek General Permit are referred to as “Participating Landowners” and the agreements they enter into with LCWMD are referred to as “Participating Landowner Agreements.” As stated in the Long Creek General Permit, the LCWMP was:

“developed jointly by the municipalities of South Portland, Portland, Westbrook and Scarborough, along with other entities, and approved by the Maine Department of Environmental Protection, for the purpose of restoring the water quality of Long Creek”

As stated in Participating Landowner Agreements, cooperative implementation of the LCWMP:

“which includes but is not limited to design, engineering, construction, reconstruction, installation, operation, modification, alteration, use, maintenance, repair, replacement, inspection and monitoring of public and private stormwater management structures, facilities and improvements and in-stream and riparian restoration in and along Long Creek and within the Long Creek Watershed, is likely to reduce the cost and time for Long Creek to comply with Water Quality Standards”

Who are the Stakeholders?
LCWMD implements the LCWMP on behalf of 97 Participating Landowners. Approximately 88% of the watershed’s IC, and approximately 96% of the total regulated IC in the watershed, is managed under the LCWMP. The permittees include:

- 91 private landowners, primarily commercial and retail properties with IC ranging from rooftops, driveways, sidewalks, and parking lots.
- Three municipalities, whose IC primarily consists of roads and sidewalks
- Two state entities, which are both transportation agencies:
  - Maine Department of Transportation (Maine DOT), and
  - Maine Turnpike Authority (MTA).
- One quasi-municipal entity, ecomaine — a regional waste management facility providing recycling and waste-to-energy services to a number of southern Maine municipalities.
What is the Role of the LCWMD Board of Directors?
The LCWMD Board of Directors was established by “Interlocal Agreement” among the municipalities of Portland, Scarborough, South Portland, and Westbrook, of which portions of each lie within the Long Creek Watershed, to oversee LCWMD activities. The Interlocal Agreement provides for up to sixteen Board members, which were apportioned in the Interlocal Agreement to represent private and public stakeholders relative to their respective interests in the watershed. The members and organizations represented on the LCWMD Board of Directors in 2016 are shown in Table 2.

Table 2 LCWMD Board of Directors in 2016

<table>
<thead>
<tr>
<th>ORGANIZATIONAL REPRESENTATION</th>
<th>BOARD MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland</td>
<td></td>
</tr>
<tr>
<td>1 municipal representative</td>
<td>Doug Roncarati, City of Portland</td>
</tr>
<tr>
<td>Portland</td>
<td></td>
</tr>
<tr>
<td>1 private Participating Landowner or non-profit representative</td>
<td>Curtis Bohlen, Treasurer, Casco Bay Estuary Partnership</td>
</tr>
<tr>
<td>Scarborough</td>
<td></td>
</tr>
<tr>
<td>1 municipal representative</td>
<td>Dan Bacon, Chair, Town of Scarborough</td>
</tr>
<tr>
<td>Scarborough</td>
<td></td>
</tr>
<tr>
<td>1 public or private Participating Landowner</td>
<td>Arthur Colvin, ecomaine</td>
</tr>
<tr>
<td>South Portland</td>
<td></td>
</tr>
<tr>
<td>2 municipal representatives</td>
<td>Fred Dillon, Vice Chair and Secretary, City of South Portland</td>
</tr>
<tr>
<td>2 municipal representatives</td>
<td>Tom Blake, City of South Portland</td>
</tr>
<tr>
<td>South Portland</td>
<td></td>
</tr>
<tr>
<td>4 private Participating Landowners</td>
<td>Ed Palmer, Portland Marriott at Sable Oaks</td>
</tr>
<tr>
<td>South Portland</td>
<td></td>
</tr>
<tr>
<td>1 non-profit representative</td>
<td>None appointed</td>
</tr>
<tr>
<td>Westbrook</td>
<td></td>
</tr>
<tr>
<td>1 municipal representative</td>
<td>None appointed</td>
</tr>
<tr>
<td>Westbrook</td>
<td></td>
</tr>
<tr>
<td>2 private Participating Landowners</td>
<td>Adam Pitcher, Sysco</td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>1 Maine DOT representative</td>
<td>Peter Newkirk, P.E.</td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>1 MTA representative</td>
<td>John Branscom</td>
</tr>
</tbody>
</table>

More information on Board members and Board activities are posted on the LCWMD website under the Management and Documents sections.

Administration
In accordance with the Interlocal Agreement and Participating Landowner Agreements, implementation of the LCWMP has been primarily delegated to the LCWMD. LCWMD’s Executive Director manages the day-to-day implementation of the LCWMP. In 2016, LCWMD hired an Executive Director who reports directly to the Board of Directors. LCWMD maintains a Services Agreement with the Cumberland County Soil & Water Conservation District (CCSWCD) to provide administrative and technical support services to LCWMD. In addition, LCWMD contracts with a number of third-party contractors to provides services such as engineering, construction, structural Best Management Practice (BMP) inspection and maintenance, pavement sweeping, catch basin cleaning, landscaping, and fiscal auditing services.

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3 Information on Board members and activities are available on the LCWMD website at: http://www.restorelongcreek.org.
Board Meetings
The LCWMD’s Board of Directors met on the following dates. Minutes and other information are available on the Long Creek website. Board meetings are open to attendance and public comment by Participating Landowners and the general public.

- January 27, 2016
- February 24, 2016
- April 6, 2016
- May 24, 2016
- June 22, 2016
- July 27, 2016
- August 24, 2016
- September 21, 2016
- October 27, 2016
- December 7, 2016

Fiscal Summary
LCWMD maintains its accounting based on a fiscal year that runs from July 1 to June 30 each year. Annual budgets for the subsequent fiscal year are provided to Participating Landowners in February and the Board must adopt a final budget for the ensuing fiscal year no later than July 1 of each year. LCWMD’s revenue generated from fees paid by Participating Landowners is approximately $1.5 million annually. As of the end of December 2016, LCWMD had current assets of approximately $1.8 million and was carrying approximately $5.25 million worth of fixed assets (primarily LCWMD constructed BMPs) on its books. The $1.8 million in current assets reflects approximately $1.6 million that was budgeted in fiscal year 2017 for design and construction of an in-stream restoration project for the Main Stem of Long Creek. Because it is anticipated that design and construction of the Main Stem restoration project will not commence until late fiscal year 2017 or early fiscal year 2018, these funds will be carried forward into the fiscal year 2018 and 2019 budgets. Long-term liabilities were approximately $1.1 million and are primarily related to LCWMD’s Maine Municipal Bond Bank loan.

Communications with Participating Landowners
Specific outreach communications to update Long Creek Participating Landowners and those signed up for the Long Creek list serve included the following:

- January 2016 – Currents Eblast: Request for Qualifications, Water Quality Monitoring Services
- April 6, 2016 – General News Eblast: Spring Cleanup Sweeping Scheduled
- June 3, 2016 – General News Eblast: Request for members to join the reconvening Technical Advisory Committee
- June 28, 2016 – General News Eblast: Audit Services Request for Proposals Issued
- July 8, 2016 – General News Eblast: LCWMD Board Takes a Tour of Several Long Creek Restoration Elements
- July 11, 2016 – General News Eblast: Addendum to Audit Services Request for Proposals
- August 9, 2016 – General News Eblast: Green SnowPro Training in Portland

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4 Board agendas and minutes are available on the LCWMD website at: http://www.restorelongcreek.org/custom/documents.
• August 17, 2016 – General News Eblast: LCWMD Landowner Fact Sheets Now Available with Information on Maintenance Practices
• September 12, 2016 – General News Eblast: American Society of Civil Engineers/Environmental Water Resource Initiatives 2016 International Low Impact Development Conference Long Creek BMP Tour a Great Success
• September 13, 2016 – General News Eblast: LCWMD’s New Executive Director
• November 21, 2016 – General News Eblast: Catch Basin Cleaning Request for Proposals
• December 2, 2016 – General News Eblast: LCWMD Catch Basin Cleaning to Resume mid-December

Structural Management Opportunities
Implementation of the structural aspects of the LCWMP includes but is not limited to design, engineering, construction, and reconstruction of public and private stormwater management structures. Section 5 of the LCWMP identifies and recommends “structural management opportunities for the built environment” which are prioritized by catchment area. The goal of the structural management opportunities is to provide treatment for up to 150 acres of IC within the Long Creek Watershed, of which approximately 107 acres has been addressed by structural management projects to date.

A summary of the structural management projects completed in the watershed to date is identified in Table 3.

Table 3 Summary of Structural Project Construction to Date

<table>
<thead>
<tr>
<th>Branch</th>
<th>Date</th>
<th>Catchment</th>
<th>Best Management Practices Installed</th>
<th>Acres IC Treated</th>
<th>Other Total</th>
<th>LCWMD Total</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Branch</td>
<td>2009</td>
<td>E-24 (Philbrook Ave)</td>
<td>Filterra tree box filters, Stormtreat filter units and Stormtech storage chambers</td>
<td>2.12</td>
<td>$445,324</td>
<td>$445,324</td>
<td>$445,324</td>
</tr>
<tr>
<td>South Branch</td>
<td>2009</td>
<td>Maine Mall Road</td>
<td>Credits to Maine DOT for pervious asphalt project</td>
<td>2.5</td>
<td>$368,112</td>
<td>$368,112</td>
<td>$368,112</td>
</tr>
<tr>
<td>North Branch</td>
<td>2010</td>
<td>C-11 (Darling Ave I &amp;II)</td>
<td>Filterra tree box filters, soil media filters, landscaped media filters</td>
<td>7.21</td>
<td>$596,387</td>
<td>$596,387</td>
<td>$596,387</td>
</tr>
<tr>
<td>Lower Main Stem</td>
<td>2010</td>
<td>A1-05 (Mall Plaza Phase I)</td>
<td>Multi-cell soil media filter to collect and</td>
<td>11</td>
<td>$965,906</td>
<td>$965,906</td>
<td>$965,906</td>
</tr>
</tbody>
</table>

5 Additional details on each construction project are available on the LCWMD website at: http://www.restorelongcreek.org/pages/projects/overview.
6 American Recovery & Reinvestment Act Funds; 0% Interest loan, 27.7% principal forgiveness.
<table>
<thead>
<tr>
<th>Branch</th>
<th>Date</th>
<th>Catchment</th>
<th>Best Management Practices Installed</th>
<th>Acres IC Treated</th>
<th>Other Total</th>
<th>LCWMD Total</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Main Stem</td>
<td>2010</td>
<td>A1-05 (Mall Plaza Phase II)</td>
<td>Underground Stormtech chambers installed to store runoff; Stormtreat systems installed to treat runoff</td>
<td>3.5</td>
<td>$30,000</td>
<td>$257,617</td>
<td>$287,617</td>
</tr>
<tr>
<td>Blanchette Brook</td>
<td>2012</td>
<td>B-21 (Blanchette Brook Restoration Project)</td>
<td>Gravel wetland, soil media filters, Stormtech chambers and Brentwood Units</td>
<td>16.39</td>
<td></td>
<td>$615,796</td>
<td>$615,796</td>
</tr>
<tr>
<td>Upper Main Stem</td>
<td>2012</td>
<td>Port Resources</td>
<td>Installation of bioretention cells as part of a grandfathered addition to an industrial park</td>
<td>1.97</td>
<td>$57,145</td>
<td></td>
<td>$57,145</td>
</tr>
<tr>
<td>Upper Main Stem</td>
<td>2012</td>
<td>Gannett Drive</td>
<td>Retrofit of settling basin with inlet gate valve and gravel underdrained soil filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Branch</td>
<td>2013</td>
<td>C-08 (Fairchild and TI facilities)</td>
<td>Fairchild (13.23 acres): Basin retrofitted as a gravel wetland, removed IC and installed 9 tree islands. TI (5.26 acres): installed one wet pond, one wet vegetated treatment system and three bioretention cells.</td>
<td>18.49</td>
<td>$200,000</td>
<td>$323,484</td>
<td>$523,484</td>
</tr>
<tr>
<td>Lower Main Stem</td>
<td>2014</td>
<td>Gorham Road</td>
<td>Redesign of medians to provide shade, aesthetics and treatment where the road drains to median</td>
<td>2</td>
<td>$150,000</td>
<td>$476,348</td>
<td>$626,348</td>
</tr>
<tr>
<td>Lower Main Stem</td>
<td>2014</td>
<td>Maine Mall Road (Western Ave to Gorham Road)</td>
<td>Redesign and treatment of road segment</td>
<td>8.4</td>
<td></td>
<td>$682,564</td>
<td>$682,564</td>
</tr>
</tbody>
</table>

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7 Estimated costs of retrofits installed and paid for by Texas Instruments.
8 City of South Portland contribution to the project.
### Work Completed This Year

#### South Branch Structural Management Opportunities

The LCWMP identified several structural management opportunities for the South Branch of Long Creek, one of these being the retrofit of the GGP-Maine Mall L.L.C. wet pond on Philbrook Avenue, construction of which was substantially completed in 2015. In 2012, the LCWMD identified the opportunity to construct retrofits in parking areas at the Maine Mall, a portion of which would drain to a detention basin and a portion of which would drain into the South Branch of Long Creek, that could be designed and constructed concurrent with the retrofit of the GGP-Maine Mall L.L.C. wet pond. These structural retrofits included the construction of bioretention facilities and landscaped islands. This project was colloquially referred to as the “Greening of the Maine Mall.” LCWMD engaged an engineering firm to design the “Greening of the Maine Mall” project and 75% complete design plans were prepared by the contractor by July 2015.

On September 30, 2015, there was a large storm event in the Long Creek Watershed. This event caused the South Branch to flood the parking areas that drain into the South Branch and upon which the “Greening of the Maine Mall” project would have been undertaken. After the storm event, the LCWMD Board of Directors and staff met to discuss planned retrofits and the flooding issues in the South Branch. It was decided that studies were needed to determine the causes of the flooding and identify steps to reduce future flooding risks. A committee to the Board of Directors was created to complete this study. Based on the need to look at the stream channel, the Board decided to postpone the additional structural projects at the Maine Mall until the study and committee recommendations were completed.

During 2016, LCWMD requested that CCSWCD conduct an investigation of accumulated sediment in the South Branch of Long Creek from Maine Mall Road to John Roberts Road. The investigation identified that the flooding was caused by three drainage outfalls that would normally discharge to the South Branch channel. The investigation further identified that these three outfalls were submerged under standing water and accumulated sediment in the stream channel. A memorandum prepared by CCSWCD after completing the investigation concluded that “because of the accumulated sediment and potentially restricted flow, the upper section of the South Branch channel can neither convey nor store the runoff entering it.” The memorandum identified several options for removing sediment from the channel and included a preliminary cost estimate for disposal of dredged materials. The South Branch

<table>
<thead>
<tr>
<th>Branch</th>
<th>Date</th>
<th>Catchment</th>
<th>Best Management Practices Installed</th>
<th>Acres IC Treated</th>
<th>Other Treated</th>
<th>LCWMD Total</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Branch</td>
<td>2015</td>
<td>Maine Mall</td>
<td>Detention basin retrofitted to a gravel wetland.</td>
<td>33.9</td>
<td></td>
<td>$657,781</td>
<td>$657,781</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td>107.48</td>
<td>$2,444,762</td>
<td>$3,381,702</td>
<td>$5,826,464</td>
</tr>
</tbody>
</table>

![South Branch Flooding](image-url)
Committee formed by the Board of Directors considered the memorandum prepared by CCSWCD and made a recommendation to the full Board that the portion of the “Greening of the Maine Mall” project that drains into the South Branch should not be completed at this time. The Board subsequently authorized CCSWCD to develop the preliminary cost estimate for South Branch dredging into a final cost estimate. LCWMD will consider its role in this project upon review of the final cost estimate. Given the minimal anticipated water quality benefits of constructing the limited portion of the “Greening of the Maine Mall” project that does not drain to the South Branch, that component of the project was also tabled.

Future Projects

_Hannaford Basin_

The LCWMP identified expansion and enhancement of the “Hannaford Shopping Plaza’s existing stormwater detention basin to provide improved water quality treatment” as a structural management opportunity. LCWMD anticipates undertaking the process of identifying a design contractor and having that contractor prepare a design for this project in 2017 and 2018 with construction taking place 2019.

In addition to the Hannaford basin project, the Board of Directors intends to retain a budget allocation for at least one additional yet-to-be identified significant structural management or in-stream or riparian restoration project in the watershed.

A summary of future structural management projects identified to be completed in the watershed to date is identified in Table 4.

_Table 4 Future Structural Projects Estimated Timeline_

<table>
<thead>
<tr>
<th>Branch</th>
<th>Date</th>
<th>Catchment</th>
<th>Best Management Proposed</th>
<th>Acres IC Treated</th>
<th>Estimated LCWMD Total</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Branch</td>
<td>2019</td>
<td>Hannaford Basin (E-34)</td>
<td>Revised estimate from LCWMP</td>
<td>10</td>
<td>$400,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>$400,000</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

Structural BMP Inspection and Maintenance

Inspection and maintenance of structural BMP’s has been identified as a substantial ongoing effort and cost. LCWMD presently inspects and maintains 92 LCWMD-owned-or-operated structural BMP’s in the Long Creek Watershed. During 2016, substantial efforts were undertaken to identify inspection and maintenance schedules and costs for individual BMPs. This work included identification and spatial inventories of individual BMPs throughout the watershed, tracking maintenance costs, and development of inspection and maintenance standard operating procedures for each type of BMP managed by LCWMD. Each BMP was assigned an individual BMP number and accounting practices will allow the inspection and maintenance costs of individual BMPs to be tracked. This information will be used to project future inspection and maintenance schedules and budgets and will guide LCWMD’s decision-making process should additional structural BMPs be considered. In addition, landscaping services for constructed BMPs will require significant ongoing effort and finances. Landscaping includes services such as mowing, mulching, weeding, trash removal, seeding, and cutting of vegetation for winter dormancy. For fiscal year 2017, LCWMD budgeted approximately $56,000 for routine landscaping.
maintenance. This amount is expected to increase significantly for fiscal year 2018 as additional BMPs are added to the annual landscaping maintenance schedule.

Nonstructural Management Opportunities

Implementation of non-structural aspects of the LCWMP include but are not limited to “stormwater runoff management techniques that do not require extensive construction efforts and either limit the generation of stormwater runoff or reduce the amount of pollutants contained in the runoff.”

Restoration Opportunities for the Aquatic Environment

In addition to the structural and nonstructural management activities to prevent and treat pollution for improved stormwater quality, the LCMWP calls for restoration measures to improve the aquatic environment. These projects include improvements to riparian and in-stream habitats to mitigate damage that has been caused to aquatic habitats over time. As identified in the LCWMP, undertaking these projects will encourage the habitat conditions needed for the re-colonization of Long Creek by aquatic species more indicative of a healthy stream such as pollution-sensitive macroinvertebrates and brook trout.

A summary of in-stream and riparian projects completed in the watershed to date is identified in Table 5.

Table 5 Summary of Restoration Projects to Date

<table>
<thead>
<tr>
<th>Branch</th>
<th>Date</th>
<th>Catchment</th>
<th>Best Management Practices Installed</th>
<th>Other Total</th>
<th>LCWMD Total</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanchette Brook</td>
<td>2011</td>
<td>Colonel Westbrook</td>
<td>In-stream and riparian enhancement</td>
<td>$29,480</td>
<td>$163,735</td>
<td>$193,215</td>
</tr>
<tr>
<td>Main Stem</td>
<td>2014</td>
<td>Lower Main Stem</td>
<td>In-stream and stream bank stabilization</td>
<td></td>
<td></td>
<td>$39,258</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$29,480</td>
<td>$202,993</td>
<td>$232,473</td>
</tr>
</tbody>
</table>

Future Projects

Main Stem Restoration

In 2016, in-stream and riparian restoration efforts focused on the Main Stem restoration project that was recommended by the Expert Review Panel (“ERP”) convened in 2014 and 2015 to review the status of the implementation of the LCWMP at that time. The Main Stem restoration project as recommended by the ERP will focus on the segment of the Main Stem of Long Creek between Maine Mall Road and Foden Road. This restoration effort will reconnect the stream flood plain by removing accumulated gravel and sediment. The effort will also remove two un-needed stormwater detention basins that were installed in the flood plain.

Following the ERP’s recommendation, LCWMD engaged geomorphology and engineering consultants to develop a “conceptual design” as a first step toward implementing the ERP’s recommended project. The conceptual design was completed in June 2015. In February 2016, a construction estimate was prepared for the “conceptual design” which identified estimated construction costs for the project at

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9 Additional details on each construction project are available on the LCWMD website at: http://www.restorelongcreek.org/pages/projects/overview.
$1.2 million. This figure was based on certain assumptions about disposal costs for cut material and did not include permitting or design costs. Given the magnitude of the budget for the project, LCWMD’s Board established an advisory committee, the Main Stem Committee, to ensure that maximum value would be received for this substantial monetary investment.

The project is currently being reviewed to identify areas of potential cost savings while maintaining the core components of the project to ensure the most efficient and effective use of LCWMD funds. It is anticipated that design and limited construction will commence in 2017 with construction continuing through 2018.

In addition to the Main Stem restoration project, the Board of Directors intends to retain a budget allocation for at least one additional yet-to-be identified significant structural management or in-stream or riparian restoration project in the watershed.

Table 6 shows the remaining anticipated restoration projects for the aquatic environment and their estimated timeline based on adaptations made by the Board.

### Table 6 Future Projects Estimated Timeline

<table>
<thead>
<tr>
<th>Branch</th>
<th>Date</th>
<th>Catchment</th>
<th>Best Management Proposed</th>
<th>Estimated LCWMD Total</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Stem</td>
<td>2017-2018</td>
<td>Stream restoration project</td>
<td>In-stream and floodplain restoration projects in the Main Stem section from Maine Mall Road to Foden Road</td>
<td>$1,600,000</td>
<td>$1,600,000</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$1,600,000</strong></td>
<td><strong>$1,600,000</strong></td>
</tr>
</tbody>
</table>

**Inspections**

During 2016, LCWMD’s parcel inspection program was carried out by staff from CCSWCD who conducted 108 inspections of Participating Landowner properties in the watershed. The focus for this inspection season was engaging Participating Landowners and/or property managers in the inspection process and resolution of issues identified during inspections. CCSWCD staff made a concerted effort to invite landowners to accompany their field staff during parcel inspections, ensure that landowners were aware of site-specific operation and maintenance plans and maps, and discuss responsibilities of Participating Landowners’ relative to the responsibilities of LCWMD with respect to implementing the LCWMP.

Subsequent to parcel inspections, Participating Landowners were sent annual inspection reports detailing follow-up actions requested by inspection staff. Table 7 is provided to illustrate the relative numbers of the common issues identified during parcel inspections as needing corrective actions. Outreach to landowners was conducted to follow up on corrective actions and provide technical assistance.
Table 7 Common Issues Identified During Parcel Inspections as Needing Corrective Action

<table>
<thead>
<tr>
<th>Operation and Maintenance Inspection Element</th>
<th>Corrective Action Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catch Basin Systems – Cleaning</td>
<td>235</td>
</tr>
<tr>
<td>Vegetated Areas and Slopes</td>
<td>51</td>
</tr>
<tr>
<td>Stormwater Channels</td>
<td>36</td>
</tr>
<tr>
<td>Roadways and Parking Surfaces</td>
<td>34</td>
</tr>
<tr>
<td>Catch Basin Systems – Structural</td>
<td>24</td>
</tr>
<tr>
<td>Stormwater Detention and Retention Facilities</td>
<td>19</td>
</tr>
<tr>
<td>Outfall Stability</td>
<td>13</td>
</tr>
<tr>
<td>Trash/Litter</td>
<td>8</td>
</tr>
<tr>
<td>Fats, Oils, Grease</td>
<td>7</td>
</tr>
<tr>
<td>Dumpster Management</td>
<td>5</td>
</tr>
<tr>
<td>Snow Removal and Sand/Salt Storage</td>
<td>5</td>
</tr>
<tr>
<td>Pollution Prevention – Material and Other Hazardous Waste Management</td>
<td>4</td>
</tr>
<tr>
<td>Runoff Infiltration Facilities</td>
<td>3</td>
</tr>
<tr>
<td>Culverts</td>
<td>2</td>
</tr>
<tr>
<td>Property Water Quality Units</td>
<td>2</td>
</tr>
</tbody>
</table>

Pollution Prevention

As identified in the LCWMP, pollution prevention is aimed at reducing or eliminating waste at the source, promoting the use of non-toxic or less-toxic substances, implementing conservation techniques, and re-using materials rather than putting them into the waste stream.

Fact Sheets

LCWMD’s Pollution prevention initiatives in 2016 were focused on developing the following fact sheets for distribution to Participating Landowners and for general availability to the public, all of which are available on LCWMD’s website. Development of these fact sheets allows LCWMD to efficiently address the most commonly encountered issues in the Long Creek Watershed.

Coal Tar: Coal-tar sealants are a black liquid made from coal-tar pitch or crude coal tar that is sprayed or painted onto pavement. These products are used to maintain the black appearance of pavement, and

10 Fact sheets are available on LCWMD website at: http://www.restorelongcreek.org/custom/documents.
reapplication is needed every two to five years to keep the desired look. Coal-tar sealants contain polycyclic aromatic hydrocarbons (PAHs). Stormwater runoff can carry PAHs from sealed pavement directly into rivers, streams, lakes, and the ocean, potentially affecting fish and other aquatic life.

**Dumpster Management:** Dumpsters require simple management practices to keep waste contained. Release of solids and liquids intended for disposal carry pollutants that can affect organisms living in the water.

**Fats, Oils, and Grease Management:** Fats, oils, and grease (FOG) are by-products of cooking animal and vegetable based foods. When FOG enter the stormwater drainage system, they can congeal resulting in backups in basements, sinks, or toilets. It can also be harmful to the environment and costly to remove FOG from stormwater systems. By using best management practices for FOG, they can be prevented from causing backups or making their way into Long Creek.

**Five Good Housekeeping Practices:** “Good housekeeping” means using best management practices (BMPs) that help to ensure a reduction in the amount and type of pollution that enters waterways, catch basins, and ditches. Good housekeeping BMPs include a wide range of pollution prevention measures. This fact sheet contains five BMPs that are quick and easy ways for Long Creek landowners to assist with pollution prevention.

**Spill Prevention, Control, and Reporting:** Petroleum products and chemicals can be a source of water quality impairment to Long Creek. Preventing spills from occurring is much easier than cleaning up and reporting spills after they have occurred. This fact sheet helps Participating Landowners to manage oil and similar products on their properties and to help ensure that spills are not washed into Long Creek.

**Stenciling Guide:** Using stencils to mark the pavement around catch basins and other drainage infrastructure is an easy, effective way to remind us all that our actions could impact the environment. Stenciling helps to minimize the amount of dumping into storm drains reducing the amount of pollutants entering Long Creek.

**Chlorides**

*Green SnowPro Training*

In addition to the development of pollution prevention fact sheets, the LCWMD, CCSWCD, and the Interlocal Stormwater Working Group co-sponsored a Green SnowPro training session on Thursday, September 22, 2016 in Portland. The Green SnowPro training was aimed at educating winter maintenance professional on methods of managing winter salt use. Chlorides resulting from winter salt application have been identified as a water pollutant in Long Creek that can harm fish, bugs, and other organisms that inhabit Long Creek. This training opportunity was identified as appropriate for public works staff, transportation agency staff, and private contractors that plow roads and provide property management services.

**Pavement Sweeping**

Pavement sweeping was completed by LCWMD on parking lots and roads by third-party contractor(s) for most properties managed under the Long Creek General Permit and Participating Landowner Agreements. Solids collected through sweeping are designated for disposal at CPRC Group facility in Scarborough, Maine. LCWMD budgeted $115,000 for pavement sweeping in FY2017.
In addition to general parcel sweeping, “hot spots” were identified on a site-specific basis based on known high-traffic areas (high-turnover parking lots, drive-thru windows, and other high usage areas) and observations of areas where street dust tends to accumulate. Specifics pertaining to sweeping in 2016 include the following:

- Spring cleanup, large particle collection, approximately 250 acres swept
- Spring cleanup, collection of fines, approximately 250 acres swept
- Hotspot sweeping completed two times, approximately 54 acres swept per event
- Maine Mall Road porous pavement completed once, approximately 1.2 acres swept

Figure 3 shows the total tons of sweeping collected by annual sweeping activities from 2011 to 2016.

![Sweeping Activities Tons of Sweepings Collected](image)

**Figure 3 Tons of Sweepings Collected by Year**

**Catch Basin Cleaning**

Catch basin cleaning was completed by third-party contractor(s) for properties managed under the Long Creek General Permit and Participating Landowner Agreements. Solids collected through catch basin cleaning are designated for disposal at the CPRC Group facility in Scarborough, Maine.

In 2016, catch basins were opened and sediment was measured using a rod. Basins with sediment depth 50% or higher from the sump to the outlet invert were identified for cleaning. Eighty-two catch basins were cleaned in the fall of 2016. Approximately 22 tons of catch basin grit was collected and disposed of at CPRC Group.

**Monitoring**

LCWMD has been implementing the *Long Creek Monitoring Plan* and associated *Quality Assurance Project Plan (QAPP)* since late summer 2010. More detailed information is available in the *Long Creek Monitoring Plan* and QAPP that were developed with input from the Long Creek Technical Advisory Committee and approved by DEP.
Monitoring Locations
The monitoring locations depicted in Figure 4 were identified for monitoring in 2016, which are consistent with the previous year’s program.

Figure 4 Monitoring Locations

Goal of Monitoring
Monitoring of conditions in Long Creek as funded by landowners in the watershed reflect specific regulatory and management needs. These are:

1. To determine whether or not Long Creek meets applicable water quality standards;
2. To gather information to improve management of Long Creek; and,
3. To document effectiveness of restoration programs and progress towards meeting standards.

The Long Creek Monitoring Plan was developed in order to evaluate baseline chemistry and flow conditions and monitor stream recovery at predetermined points across the watershed. The Long Creek Monitoring Plan is focused on gathering the information needed to monitor Long Creek restoration efforts.
Monitoring Plan Implementation
The Long Creek Monitoring Plan and QAPP were implemented in 2016 by LCWMD’s private monitoring contractor with support provided by CCSWCD and oversight provided by LCWMD. Long Creek’s monitoring program includes primarily continuous monitoring, collection of grab samples, hydrologic monitoring, and biomonitoring. LCWMD’s monitoring contractor provided a monitoring services summary report to LCWMD for the 2016 calendar year on January 31, 2017. In fiscal year 2017, LCWMD budgeted approximately $115,000 for implementation of the Long Creek Monitoring Plan and related activities.

Monitoring Database
In 2016, LCWMD began using a new database to store water quality monitoring data collected by its water quality monitoring contractor. The database was developed by a third-party under contract with LCWMD. Since the database became active, the database has resided on the contractor’s server. LCWMD has had difficulty accessing data from the database as it resides behind the contractor’s firewall and, therefore, provides LCWMD with limited direct access to the data. LCWMD is identifying options to move the database to a LCWMD-controlled server to provide full access to the data. In addition, LCWMD has identified the need for a robust tool for analyzing historic data. In late 2016, LCWMD began working with Maine DEP to import LCWMD’s monitoring data into the Water Resources Database (WRDB). The WRDB should provide LCWMD with the ability to analyze historic data efficiently and effectively.

Technical Advisory Committee
LCWMD reconvened the Technical Advisory Committee that provides recommendations to LCWMD and its Board of Directors on technical aspects of the Long Creek Monitoring Plan and QAPP. The committee is comprised of volunteers and includes members of the Long Creek Board of Directors with monitoring experience, staff from Maine DEP, LCWMD’s monitoring program contractor, and an environmental consultant, with support from LCWMD and CCSWCD staff.

Biomonitoring
Pursuant to the Long Creek Monitoring Plan, invertebrate monitoring will be performed at primary monitoring locations twice in every five-year period (i.e., 2013, 2015, 2018, and 2020). In 2015, Maine DEP conducted biomonitoring at four monitoring locations, the results of which became available in 2016. The biomonitoring occurred at three locations in the lower watershed in South Portland (Stations 752, 414, and 408) and one location in the upper watershed in Westbrook (Station 411).

Station 752 is located in the Main Stem of Long Creek approximately 30 meters upstream of Foden Road. For the 2015 biomonitoring event, Maine DEP concluded that the macroinvertebrate community does not meet the minimum Class C aquatic life criteria.

Station 414 is located in at the base of the North Branch of Long Creek. For the 2015 biomonitoring event, Maine DEP concluded that the macroinvertebrate community does not meet Class C aquatic life criteria.

Station 408 is located in the South Branch of Long Creek. For the 2015 biomonitoring event, Maine DEP concluded that the aquatic community does not meet Class C aquatic life criteria.
Station 411 is located in the upper Main Stem of Long Creek. For the 2015 biomonitoring event, Maine DEP concluded that the macroinvertebrate community did not meet Class B aquatic life criteria but did meet the minimum Class C criteria for aquatic life.