

City of Portland, Oregon

Total Maximum Daily Load (TMDL) Implementation Plan

ANNUAL STATUS REPORT NO. 8

Fiscal Year 2015-2016
(July 1, 2015 – June 30, 2016)

Prepared for:
Oregon Department of Environmental Quality

Submitted by:
City of Portland

Submitted on:
November 1, 2016

Table of Contents

1.0	Introduction	1
	Report Organization	1
2.0	Adaptive Management	1
	Annual Process	1
	Comprehensive Process.....	2
3.0	Citywide Management Strategies.....	2
4.0	Temperature Management Strategies	2

List of Tables

Table 1.	Public Involvement (PI)	3
Table 2.	Operations and Maintenance (OM)	8
Table 3.	Illicit Discharge Detection and Elimination (ILL).....	10
Table 4.	New Development Standards (ND).....	11
Table 5.	Natural Systems (NS).....	14
Table 6.	Structural Controls (STR)	18
Table 7.	Program Management (PM)	20
Table 8.	Monitoring.....	21
Table 9.	Temperature Management Strategies.....	22

1.0 Introduction

This eighth Annual Status Report (report) summarizes key activities and accomplishments in accordance with the City of Portland's 2014 *Total Maximum Daily Load (TMDL) Implementation Plan for the Willamette River and Tributaries*. The report summarizes the implementation status of the City's activities and management strategies to reduce TMDL pollutants in local waterbodies during fiscal year (FY) 2015-16 (July 1, 2015 through June 30, 2016).

Many activities outlined in this TMDL report are also conducted to fulfill obligations under the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit No. 101314 (MS4 permit).¹ A multitude of environmental programs and activities that the City employs provide an effective response to address both point and non-point sources of pollutants under MS4 and TMDL requirements. A separate annual report is submitted to the Oregon Dept. of Environmental Quality (DEQ) for compliance with the City's MS4 Permit and associated 2011 *Stormwater Management Plan (SWMP)*. Results from the City's monitoring efforts during the FY are provided in the MS4 annual compliance report.

Report Organization

This annual TMDL report covers implementation actions and accomplishments that occurred during FY 2015-16. The report is organized into the following sections:

- Adaptive Management
- Citywide Management Strategies
- Temperature Management Strategies

2.0 Adaptive Management

The City uses an adaptive management approach for its TMDL program to identify whether the TMDL Implementation Plan needs to be modified for improved effectiveness. This includes both an annual process and a more comprehensive longer-term process.

Annual Process

The City conducts an annual adaptive management process in conjunction with preparing each annual TMDL status report to determine if the City's TMDL program is being implemented in

¹ TMDLs divide a total allowable pollutant load into allocations to point sources (called waste load allocations) and non-point sources (called load allocations) and several other input factors. Point source waste load allocations established in TMDLs are implemented through NPDES permits.

accordance with the TMDL Implementation Plan and identify whether any program adjustments are needed. For FY 2015-16, the City determined that the TMDL program is being implemented in accordance with the TMDL Implementation Plan and that no program adjustments are needed at this time.

Comprehensive Process

In 2013, the City conducted a comprehensive process as part of the TMDL Implementation Plan *Fifth Year Review Report*, which included an in-stream water quality trends analyses for TMDL parameters for which data were available. Under MS4 permit requirements in 2014, the City also conducted waste load allocation effectiveness evaluations and evaluated progress towards meeting benchmarks. In 2015, the City prepared updated benchmarks for addressing TMDL waste load allocations as part of the MS4 permit renewal package.

In summary, both the water quality trends analyses and the results of the NPDES MS4 progress to WLAs and associated benchmarks indicated that the TMDL program has been effective. Implementation of the strategies included in the MS4 SWMP and the TMDL Implementation Plan will continue to contribute to the overall reduction of TMDL pollutants. No major program adjustments were deemed to be necessary. The next 5-year review report is due November 1, 2018.

3.0 Citywide Management Strategies

Tables 1 through 8, provided on the following pages, summarize the City's activities conducted in FY 2015-16 to implement the citywide management strategies identified in Section 3 of the TMDL Implementation Plan. As mentioned above, many of the strategies are based on the City's SWMP. Additional information and greater detail on SWMP BMP implementation can be found in the NPDES MS4 Annual Compliance Report for Permit Year 21, submitted to DEQ on November 1, 2016.

4.0 Temperature Management Strategies

Following the citywide management strategies in Tables 1 through 8, Table 9 provides a summary of activities conducted in FY 2015-16 to implement temperature management strategies identified in Section 4 of the TMDL Implementation Plan.

Table 1. Public Involvement (PI)

Strategy	Implementation Activities FY 2015-16
<p>1. Provide water quality education and curriculum resources for K-12 students.</p>	<ul style="list-style-type: none"> • Reached 5,500 students (grades K-12+) with 231 classroom programs that provide hands-on, interactive science education about stormwater and other environmental issues. • Involved 3,223 students (K-12) in 151 education field programs that offer watershed investigations and field assessments, stormwater tours, boat tours, and restoration experiences. Of these, 1,605 students in 73 classes combined education with natural area restoration service projects. • Provided canoe trips to 312 students from 17 classes in the Columbia Slough watershed. These trips were preceded by classroom studies and stewardship projects related to stormwater pollution. • Presented Clean Rivers Education’s <i>Stormwater - Soak It Up</i>, a 75-minute classroom program for 317 students from 13 classes in grades 4-college. • Led tours of sustainable stormwater management facilities for 142 students from 6 classes. Students visited swales, stormwater planters, ecoroofs, porous pavement, and creative downspout disconnections. • Led tours and provided education activities such as water quality testing at the City’s Water Pollution Control Laboratory for 224 students from 10 classes. The tour focuses on pollution prevention, onsite sustainable stormwater management at the Laboratory, and water quality based career awareness. • Presented Clean Rivers Education’s Watershed Awareness classroom program to 498 students in 20 classes, grades 3-6. This lesson focuses on non-point source pollution and pollution prevention. • Presented <i>Futures Working for Clean Rivers</i> career education classroom and field programs to 27 students in the Columbia Slough watershed.
<p>2. Educate the public about stormwater and surface water quality protection/pollution prevention and riparian and wetland protection via websites, workshops, fact sheets, and other outreach materials.</p>	<ul style="list-style-type: none"> • Mailed RiverViews, the BES annual newsletter, to more than 292,500 residential ratepayer properties. The focus of this year’s edition was the city’s aging collection system and large-scale construction projects to repair/replace miles of aging pipes with a request to readers for their cooperation at construction sites around the city. Readers learned of steps they can take at home to prevent collection system blockages/problems and about how to sign up for tours of the city’s main wastewater treatment plant. • Included inserts in City water/sewer bills mailed to more than 190,000 ratepayer properties: <ul style="list-style-type: none"> • Fall Insert (Sept, Oct, Nov 2015): “Floodplains, Watersheds, Clean Rivers” provided information on hydrology (one of the four factors of watershed health measured in the Portland Watershed Report Cards) and covered information for residents who live and work in the floodplain. • Winter Insert (Dec, Jan, Feb 2016): “Protecting Portland Waterways” provided information about water quality (one of the four factors of watershed health measured in the Portland Watershed Report Cards) and BES work to protect and improve water quality in Portland’s rivers and streams. • Spring Insert (Mar, Apr, May 2016): “Restoring Habitat for Fish and Wildlife” provided information on habitat and fish and wildlife (two of the four factors of watershed health measured in the Portland Watershed Report Cards) and culvert replacement projects that have improved both factors along Crystal Springs Creek in Portland.

	<ul style="list-style-type: none"> • Summer Insert (Jun, Jul, Aug 2016): “What Not to Flush” provided information on what not to flush in order to protect pipes and the treatment plants; how to safely dispose of medications; and how to keep fats, oils and grease from clogging sewers. • Updated and posted fact sheets, brochures, and educational materials on the BES website about: (Page stats were provided from Aug 12, 2016) <ul style="list-style-type: none"> • Sustainable stormwater management (129,194 page views) • Treebate incentive for planting yard trees (18,514 page views) • Green Street Stewards Program (18,424 page views) • Native plant resources (4,076 page views) and invasive plant resources (52,970 page views) • Brownfield Program (35,676 page views) • Maintained the City Green blog and Facebook page to highlight BES’s green infrastructure work and the work of partner organizations, including watershed councils, Friends of Trees, stewardship groups, soil and water conservation districts, and local governments. In FY 2015-16, posted 76 articles and received over 294,000 hits.
<p>3. Involve citizens in water quality improvement activities through community events, stewardship projects, and restoration projects.</p>	<p>Columbia Watershed</p> <ul style="list-style-type: none"> • Co-sponsored and/or participated in 38 community events with the Columbia Slough Watershed Council. Events included Slough 101, Groundwater 101, Explorando El Columbia Slough, Canoe the Slough events, the Columbia Slough Regatta, Aquifer Adventure, the Iraqi Society Paddle, Soup on the Slough event, one where stormwater was a topic of instruction. The City was a co-sponsor of the Columbia Slough Watershed Awards program which recognizes leadership in Columbia Slough stewardship activities. BES sponsored the Columbia Slough Watershed Council’s “Stewardship Saturdays” at Kelley Point Park, Columbia Children’s Arboretum, Smith and Bybee Lake, Wilkes Creek Headwaters, Baltimore Woods, Johnson Lake and Eastern Western Cooperation engaging 250 volunteers. The total participation included approximately 3,500 people. • Conducted public involvement and information activities for the Outfall 104B Stormwater Retrofit project via one drop in - open house event and one neighborhood association meeting. Local feedback was collected at the 30% design level and will be incorporated, where feasible. <p>Willamette Watershed</p> <ul style="list-style-type: none"> • Conducted public involvement and information activities for Willamette watershed projects via presentations to neighborhood associations, newsletter articles, an annual open house, and an annual street fair. Participated in over 20 community events, reaching over 1,500 citizens, including Multnomah Days, Sunday Parkways, rain garden workshops with East Multnomah Soil & Water Conservation District, neighborhood association meetings, and The Art of Stormwater exhibitions. • Hosted citizens at the SW Watershed Resource Center (WRC); provided technical assistance and project support to neighborhood and Friends groups in the SW Willamette River watersheds. [Also in NS-1] • In partnership with Portland Parks & Recreation and the Mt. Tabor Park Weed Warriors, 486 community volunteers spent 1,900 volunteer hours to enhance over 7 acres of parkland. [Also in NS-1]

	<p>Johnson Creek Watershed</p> <ul style="list-style-type: none"> Continued working with the Johnson Creek Watershed Council and streamside property owners to encourage watershed stewardship. Through the Johnson Creek Watershed Interjurisdictional Committee, continued to work with multiple agencies and jurisdictions throughout the Johnson Creek Watershed to conduct watershed-wide monitoring, including water quality and macroinvertebrates. Supported the Johnson Creek Watershed Council’s 18th Annual Johnson Creek Watershed-wide Restoration Event, where 283 volunteers participated in watershed improvement activities. Supported the Johnson Creek Watershed Council’s Annual Creek Cleanup, which involved 160 volunteers in cleaning up 3 tons of trash. Continue to support the Johnson Creek Watershed Council and the Crystal Springs Partnership in their efforts to remove invasive species and improve conditions along Crystal Springs, a tributary to Johnson Creek. Worked with community partners, including the Crystal Springs Partnership, Native Americans, Portland Office of Transportation and Portland Parks & Recreation, to host a Salmon Celebration and watershed health event at Westmoreland Park. Approximately 3,000 people attended. Provided information about salmon in Portland’s streams, native plants, tree planting, green streets and restoration work at and near the park. Hosted a public event at the Foster Floodplain Natural Area in May 2016, with about 400 people attending. Provided information about City efforts to improve water quality, mitigate flooding and enhance wildlife habitat at the site, as well as information about native wildlife, water quality issues in urban watersheds, tree planting and community greening efforts. Provided support to Friends of Zenger Farm, which provides environmentally friendly farming and wetland education programs. Zenger Farm employs stormwater management techniques in all aspects of farming and infrastructure. Features include permeable pavers, green roofs, catch basins, bio-swales and sustainable farming techniques. In addition, the farm is the site of a job training program by Wisdom of the Elders for Native American adults who are learning about environmental restoration. The farm hosts about 10,000 visitors a year, most of which are students. In FY 15/16, 7,552 students visited the farm and about 540 Zenger Farm volunteers logged almost 1,300 hours of service.
	<p>Westside Watersheds</p> <ul style="list-style-type: none"> Conducted public involvement and information activities for Fanno and Tryon Creek watershed projects for FY 2015-16 via direct mail, presentations to neighborhood associations and coalition committees, newsletter articles, an advisory committee, an annual open house, and an annual street fair. Projects included SW Boones Ferry Road culvert replacement, Beaverton-Hillsdale Highway stormwater retrofits, SW Stephenson and Hamilton roadside swales, SW 45th at Fanno Creek culvert replacement project, SW 19th Stormwater Facility and Greenstreet, Balch Creek Trashrack Rehabilitation, Palatine Crest Slope Stabilization and Greenstreet, SW Frank Manor Drive Greenstreet, and stream daylighting projects at Albert Kelly Park and Jackson Middle School. Worked with Southwest Neighborhoods Inc. (SWNI) to provide public information about watershed improvement and pollution prevention work conducted by the City and partner organizations. In FY 2015-16, SWNI hosted a watershed open house and published monthly watershed articles in its newsletter, which is distributed to over

	<p>9,000 homes and is available on-line. Additionally, BES published two, 4-page color inserts into the newsletter – one about Capital Improvement Projects and one about community efforts to eradicate garlic mustard.</p> <ul style="list-style-type: none"> • Responded to over 33 citizen concerns relating to stormwater issues, invasive plants, project ideas, wildlife issues, pollution or dumping concerns, and requests for stewardship and involvement. • Sponsored the Friends of Tryon Creek State Park to support field trip scholarships for 100 students. • Hosted neighbors at the SW Watershed Resource Center (WRC), located in the Southwest Neighborhoods, Inc. office at Multnomah Arts Center. Provided technical assistance and project support to neighborhood and Friends groups in the Willamette River and Fanno and Tryon Creek watersheds. Activities included: <ul style="list-style-type: none"> • Hosting of visitors in the WRC room, open during regular business hours • 23 stewardship events • Over 800 volunteers contributed roughly 1,380 hours • 19 presentations and outreach events, with over 590 total attendees • 33 landowner inquiries, with 15 onsite consultations • 39 restoration tool and equipment checkouts • Worked with the Tualatin Basin Public Awareness Committee (TB-PAC), a partnership of agencies and non-profits working to educate and involve Tualatin Basin residents. BES contributed \$900 to support stormwater education activities, including: <ul style="list-style-type: none"> • Discovery Day sponsorship • Rumba al Rio sponsorship • Bus funding for watershed field trips • Will Hornyak “Living Streams” presentations • Stream sign inventory project • Printing of “Natural Yard Care” brochure • Jackson Bottom Wetlands Preserve Education Center exhibits
	<p>Citywide</p> <ul style="list-style-type: none"> • The grant programs listed in the previous section engaged local community members in natural area restoration, stormwater management, community gardens, pollution prevention and watershed awareness. The grant program included 993 volunteers that contributed over 4,342 hours. • Continued the permanent storm drain curb marker program. Participating community and school volunteers also distributed doorhangers with stormwater pollution prevention messages and clean river tips to nearby residences. There were 76 participants in the program in FY 2015-16. • The Green Street Steward Program continued to educate and recruit volunteer Green Street Stewards. In FY 2015-16, the program reached over 1,500 individuals through tabling events and trainings. Twenty-eight people volunteered to become Green Street Stewards and adopt 93 Green Street facilities. • BES’s Tree Program conducted the following activities: <ul style="list-style-type: none"> • Provided staff support and resources through a contract with Friends of Trees (FOT) to foster recruitment, retention, and education of volunteers, with the purpose of maximizing tree planting, community involvement, and long-term survival of FOT-planted trees.

	<ul style="list-style-type: none"> • Provided support for outreach and educational programming through a partnership with Portland Parks Urban Forestry to foster a more tree-literate populace, with the purpose of maximizing urban forest education and outreach, community involvement and awareness, and long-term stewardship of the urban forest. • Provided information at community events to educate Portlanders about the importance of urban trees for clean rivers, healthy watersheds, and livable, sustainable communities; reached 548 people at 7 events.
<p>4. Implement Multnomah County's pet waste pick-up ordinance in City parks.</p>	<ul style="list-style-type: none"> • Portland Parks & Recreation continued to encourage compliance with leash and scoop laws through education, enforcement, and by providing off-leash areas. Programs include: <ul style="list-style-type: none"> • Maintaining park signage to increase awareness and understanding of leash/scoop laws. • Implement Park Ranger patrols, which use park warnings and citations to increase leash and scoop law compliance.
<p>5. Promote carpooling, use of public transportation, walking and biking.</p>	<ul style="list-style-type: none"> • Portland's Bureau of Transportation (PBOT) and Drive Less Connect continued to match carpooling partners and provide discounted carpool parking. • PBOT sponsored International Walk + Bike to School day with 51 schools participating. • PBOT continued to provide the Bicycle Lunch and Learn series, Portland by Cycle rides and classes, and Bike and Walk maps covering Portland. • PBOT coordinated the Safe Routes to School program, which included over 100 schools in the City of Portland. • PBOT coordinated Sunday Parkways, a series of free events that this year allowed 83,750 participants to use non-motorized modes of transportation along Portland streets. • The Tillikum Crossing, Bridge of the People commuter-only bridge opened in August 2015. In September, there were 92,500 bike trips over the bridge. The average weekday rider-ship is 8,000 passengers on the MAX Orange line across the bridge and 5,200 passengers on the bus lines across the bridge.
<p>6. Coordinate and implement education and outreach programs and strategies with other jurisdictions.</p>	<ul style="list-style-type: none"> • The City continues to participate in education and outreach opportunities with other jurisdictions as a member of the Oregon Association of Clean Water Agencies (ACWA) and other opportunistic and seasonal campaigns such as "Freeze the Grease, Save the Drain." • While no longer participating as a funding member of the Regional Coalition for Clean Rivers and Streams, the City anticipates sharing the Coalition's messaging and information on an informal basis, as well as participating in future campaigns on a more formal basis, including potentially funding specific campaigns. The Coalition's website and other media include information about proper disposal of pet waste; vehicle care, washing, and oil; organic/chemical-free lawn care; composting; native plants; trees; household chemicals, and dumping.
<p>7. Post the TMDL Implementation Plan and annual reports on the City website.</p>	<ul style="list-style-type: none"> • The City's TMDL Implementation Plan was posted February 2014, and the FY 2015-16 TMDL annual report was posted November 2016.

Table 2. Operations and Maintenance (OM)

Strategy	Implementation Activities FY 2015-16
<p>1. Implement an inspection, maintenance, and repair program for public stormwater collection and treatment systems.</p>	<ul style="list-style-type: none"> • Made debris screen/trash rack inspection and maintenance visits to 350 locations citywide. These locations are inspected multiple times per year. • Inspected all public stormwater management facilities (SMFs) at least once during the year. These included: <ul style="list-style-type: none"> • 150 structural BMPs (sedimentation manholes, StormFilters, Vortechincs, Stormceptors, etc.) • 248 vegetated and non-structural BMPs (swales, wetlands, ponds, sand filters, etc.) • 1,989 Green Streets • Cleaned: <ul style="list-style-type: none"> • 103 structural and non-structural BMPs • 11,372 catch basins and inlets • 32,054 lineal feet of ditch and 15,363 lineal feet of culvert • 1,806 UIC2 sedimentation and sump manholes • Repaired 4 vegetated and non-structural BMPs. • Repaired or constructed 299 inlets and inlet leads and 265 lineal feet of culvert.
<p>2. Implement an inspection program for private stormwater management facilities.</p>	<ul style="list-style-type: none"> • Under the Maintenance Inspection Program (MIP), inspected 1,194 properties (tax lots) with 2,292 associated private stormwater management facilities. Provided technical assistance and education to ensure facilities are sufficiently operated and maintained. • Inspected 1,150 private stormwater management permit projects and associated facilities to ensure construction was consistent with development permit requirements.³ These facilities account for treatment of 350.7 acres of impervious area.
<p>3. Review BES stormwater facility operations and maintenance practices and update them as necessary.</p>	<ul style="list-style-type: none"> • Continued to implement the BES Stormwater Operations and Maintenance Manual that was last updated in 2012-2013. • Continued to implement the BES Green Streets Maintenance Program using the Bureau’s adopted Level of Service that was last updated in 2016.

² The City’s Underground Injection Control, or UIC, facilities are not technically part of the MS4 system and are regulated under a different City permit (WPCF Permit # 102830).

³ The number provided represents the number of permitting projects that were ‘finalized’, i.e., constructed. The number of individual stormwater management facilities (SMFs) is roughly equivalent, but may be slightly under-reported due to projects that include more than one facility.

<p>4. Operate and maintain public streets and roads in a manner that reduces the discharge of pollutants in stormwater.</p>	<ul style="list-style-type: none"> • The 2011 PBOT <i>Maintenance Environmental Handbook</i> and the 2014 ODOT <i>Routine Road Maintenance Water Quality and Habitat Guide Best Management Practices</i> continue to be used by City road maintenance staff to ensure proper practices are used during maintenance and repair of streets. • The City continued to use magnesium chloride (MgCl₂) for deicing roads. MgCl₂ is effective at lower temperatures and requires the use of less sand and gravel.
<p>5. Provide employee training on maintenance and construction practices to protect water quality.</p>	<ul style="list-style-type: none"> • Provided annual construction inspector training to BES staff on December 1, 2015. Provided erosion control training for conducting residential inspections to BDS staff on February 16, 2016. • Provided training on the PBOT <i>Maintenance Environmental Handbook</i> for street maintenance crews. Training is given to all new employees and to specific work crews as needed.
<p>6. Implement the City's Integrated Pest Management (IPM) program to minimize the use and application of fertilizers, herbicides, and pesticides on publicly owned properties.</p>	<ul style="list-style-type: none"> • The City bureau of Portland Parks & Recreation continued to use IPM practices to manage over 11,700 acres of land at more than 250 locations. Examples of the practices that the City uses include: <ul style="list-style-type: none"> • Utilizing plants with natural resistance to pests. • Proper mowing and irrigation of park turf to increase vigor and reduce weed populations. • Mulching of planting beds to reduce establishment of weeds. • Application of selected herbicides to control invasive weeds to prevent infestation spread. • Release of natural biological control insects to control purple loosestrife infestations.
<p>7. Maintain pet waste stations and signage in parks.</p>	<ul style="list-style-type: none"> • Portland Parks & Recreation continued to encourage compliance with leash and scoop laws through education, enforcement, and by providing off-leash areas. Programs include: <ul style="list-style-type: none"> • Maintaining park signage to increase awareness and understanding of leash/scoop laws. • Implement Park Ranger patrols, which use park warnings and citations to increase leash and scoop law compliance. • Participate in community and partner events like Doggie Dash and Aarf in the Park
<p>8. Incorporate electric vehicles into the transportation fleet.</p>	<ul style="list-style-type: none"> • Continued to incorporate electric and other low-carbon fuel vehicles into the City fleet as part of its Climate Action Plan and sustainability strategies. The City currently has 288 electric or hybrid vehicles, representing approximately 36% of the sedan fleet to date.

Table 3. Illicit Discharge Detection and Elimination (ILL)

Strategy	Implementation Activities FY 2015-16
<p>1. Require new development or properties using nonconforming sanitary sewer connections to connect to the public sewer system when a public sanitary sewer is available.</p>	<ul style="list-style-type: none"> Continued to conduct activities in conformance with Portland City Code (PCC) 17.33 (Required Public Sewer Connection) which mandates that properties using onsite wastewater disposal systems or nonconforming private sewer systems connect to an available public sewer and/or otherwise make approved sewer connection upon notice to comply with city code and/or failure of the existing system.
<p>2. Limit infiltration of seepage from the sanitary sewer system to the MS4.</p>	<ul style="list-style-type: none"> The BES Stormwater System Program performed a risk analysis to identify areas in the city where existing sewage collection systems in poor condition have the potential to pose contamination threats to surface waters and groundwater. Aging infrastructure poses a risk to the environment and receiving waters when pipes fail and sewage escapes the system. The Stormwater System Planning effort will further facilitate BES' prioritization for repair, rehabilitation or replacement of system components in vulnerable areas. BES continued to evaluate the sanitary and combined sewer systems under the <i>BES System Plan</i> to prioritize pipe repairs, rehabilitation and replacement. BES also continued to implement an inflow and infiltration program for these systems, which helps address sewer capacity problems. These combined efforts along with the Sanitary Sewer Overflow program help to minimize sewage releases to the environment.
<p>3. Implement and enforce designated prohibitions on discharges to the City MS4.</p>	<ul style="list-style-type: none"> BES responded to pollution complaints and issued enforcement actions for violations of PCC 17.39. During FY 2015-16, violations resulted in 28 enforcement actions against 18 responsible parties. The count by enforcement type includes: <ul style="list-style-type: none"> 22 Notices of Violation 4 Notices of Assessment of Cost 2 Compliance Orders <p>Total penalties amounted to \$20,516, which is comprised of \$14,450 in civil penalties and \$6,066 in cost recovery.</p>
<p>4. Identify, respond to, and eliminate illicit discharges and cross connections.</p>	<ul style="list-style-type: none"> Illicit discharge monitoring during dry weather included 140 inspections conducted at 109 major outfalls. Flow was observed at 47 outfalls. Based on samples and follow-up investigations, one (1) illicit discharge was identified. The illicit discharge was corrected when the City repaired a damaged sanitary line that dye-tested positive for impact to the storm sewer.
<p>5. Require Porta-potties at parks for public events and sporting events.</p>	<ul style="list-style-type: none"> Portland Parks & Recreation continued to require large events to provide one portable restroom for every 125 people of estimated attendance.

Table 4. New Development Standards (ND)
(during construction and post-construction)

Strategy	Implementation Activities FY 2015-16
<p>1. Implement an erosion and sediment control program for ground-disturbing activities.</p>	<ul style="list-style-type: none"> • Continued to implement Portland City Code (PCC) Title 10 and the City’s 2008 <i>Erosion & Sediment Control Manual</i> (ESCM), which details requirements for development and construction-related activities in order to control the off-site release of sediment during construction and development activities. The City’s erosion control regulations: <ul style="list-style-type: none"> • Reduce sediment and pollutants in runoff from construction and development sites; • Reduce the amount of sediment and pollutants entering storm drainage systems and surface waters from any and all ground disturbing activity; • Reduce the potential for erosion from dirt and mud on public rights-of-way and surrounding properties during construction and development activities; and, • Reduce the amount of soil and dust released into the air from ground disturbing activity.
<p>2. Require erosion and sediment control plans, when applicable, during the building permit application phase.</p>	<ul style="list-style-type: none"> • Continued to impose City requirements associated with Erosion, Sediment and Pollutant Control Plans (ESPCPs) and PCC Title 10. • An ESPCP is required by the City for ground-disturbing activity that exceeds 500 square feet and that requires a City of Portland building, public works, or development permit (PCC 10.40). In addition, an ESPCP may be required for sites on steep slopes, in environmental zones, in greenway overlay zones, or in response to a violation of the City’s erosion control requirements.
<p>3. Require BMPs to prevent and control erosion and construction-associated pollutants.</p>	<ul style="list-style-type: none"> • Continued to require specific BMPs targeting erosion and other construction related pollutants. • Chapter 4 of the ESCM lists the City required BMPs for preventing erosion and controlling site sediment runoff. This includes BMPs specific to construction site entry and exit, site perimeter control, stormwater controls, general erosion prevention and instream protection. Chapter 5 covers BMPs related to other site development activities, such as dewatering, spill prevention, solid waste, equipment fueling and maintenance, and concrete waste management.
<p>4. Implement a hillside development protection code to minimize soil erosion from steep slopes.</p>	<ul style="list-style-type: none"> • In FY 2015-16, the City continued to implement the following Portland City Codes: <ul style="list-style-type: none"> • PCC 24.70.020 B.1 which prohibits grading of areas from which adverse erosion impacts can result. • PCC 24.70.020 C which requires a permit and erosion minimizing measures for tree cutting on slopes with a gradient exceeding 25%. • PCC 10.30.030 which includes additional requirements for slopes greater than 10%.

<p>5. Through the City’s <i>Stormwater Management Manual</i>, implement stormwater management requirements for new development and redevelopment to treat stormwater and control post-development peak runoff rates to levels similar to pre-development levels.</p>	<ul style="list-style-type: none"> Continued to implement PCC Title 17.38 and the City’s 2014 <i>Stormwater Management Manual</i> (SWMM) which requires new and re-development project sites to treat stormwater runoff and maintain peak flow rates at pre-development levels for the 2-, 5-, and 10-year 24-hour runoff events.
<p>6. Require new development and redevelopment to manage stormwater onsite to the maximum extent practicable.</p>	<ul style="list-style-type: none"> Continued to implement Section 1.3 of the City’s SWMM which requires onsite infiltration to the maximum extent feasible and establishes an infiltration and discharge hierarchy. The hierarchy stipulates that even if full onsite infiltration is not feasible, partial infiltration via unlined facilities may still be safe and appropriate prior to offsite discharge. If onsite infiltration is not feasible, onsite stormwater management that overflows to an offsite discharge location is required.
<p>7. Promote the use of low-impact development techniques such as bioswales, rain gardens, and other vegetated stormwater management techniques</p>	<ul style="list-style-type: none"> Continued to implement the City’s SWMM which establishes an infiltration and discharge hierarchy that prioritizes vegetated stormwater management facilities for new and re-development. Category 1 of the SWMM hierarchy “Requires total onsite infiltration with vegetated infiltration facilities. Examples of vegetated infiltration facilities include: infiltration swales, planters [and] basins.” Section 2.3 of the SWMM details the types of low-impact development techniques that are both allowed and required by the City to capture and treat stormwater runoff post-construction.
<p>8. Promote and incorporate the use of green street facilities in public and private development.</p>	<ul style="list-style-type: none"> Continued to implement the City’s “% for Green Funding” program, which provides support for the construction of green street facilities. The program takes 1 % of construction costs from City infrastructure projects that don’t trigger the SWMM and has a grant selection process to fund green street projects that meet City/Bureau and community goals. Continued to implement the City’s SWMM, which promotes the installation of “curb extensions” or green streets as an approved stormwater management technique for applicable new and re-development projects. Seven green street facilities were built by private development to meet the requirements of the City’s SWMM. The seven facilities manage 9,645 sf of public right-of-way runoff that would otherwise drain directly to Fanno Creek, Tryon Creek, or the Willamette River. Constructed two green street curb extensions to manage 32,800 sf of runoff from NE 102nd Avenue, between NE Skidmore and NE Shaver, that would otherwise drain to the Columbia Slough.

<p>9. Continue to review and update the Stormwater Management Manual.</p>	<ul style="list-style-type: none"> • Worked on updates to the 2014 SWMM. After a public comment period, the revised SWMM was adopted and became effective in August 2016 (FY 2016-17) with implementation set to occur in November 2016. Updates included: <ul style="list-style-type: none"> • Refocusing stormwater management requirements to be system specific and reinforcing the stormwater management hierarchy. • Consolidating policy issues. • Updating the user interface for the presumptive approach calculator. • Moving Chapter 4 Source Controls into a separate administrative rule and manual. • Provided training and technical assistance on the proposed 2016 SWMM updates to City staff and the development community.
<p>10. Enforce stormwater ordinances that protect water quality.</p>	<ul style="list-style-type: none"> • Continued to implement BES Enforcement Program Administrative Rules [Portland Policy Document (PPD) item ENB-4.15] which describe BES procedures for assessing violations of storm system related PCC provisions, administrative rules and permits related to the following: <ul style="list-style-type: none"> • Stormwater Management Manual [PPD item ENB-4.01] • Sewer Development Services Program (PPD item ENB-4.07) • Stormwater Discharge Program (PPD item ENB-4.13) • Sewer and Drainage Facilities Design Manual (PPD item ENB-4.14) • BES Public Works Enforcement (PPD item ENB-4.22) • BES Title 10 Discharge Enforcement Program (PPD item ENB-4.30) • Maintenance Inspection Program (PPD item ENB-4.31)

Table 5. Natural Systems (NS)

Strategy	Implementation Activities FY 2015-16
<p>1. Implement provisions of City Code that protect floodways and floodplains.</p>	<ul style="list-style-type: none"> • Continued to implement and enforce Chapter 24.50 of Portland City Code (PCC), Flood Hazard Areas. The purpose of the code is to protect the public health, safety, and welfare by restricting or prohibiting uses which are dangerous to health, safety, or property in times of flood or which cause increased flood heights or velocities, and by requiring that uses and structures vulnerable to floods be protected from flood danger at the time of initial construction. • Continued to implement the City’s Stormwater Management Manual (SWMM), which is designed to protect flow conveyance and receiving waters and to minimize impacts to properties downstream and upstream. • Continued to implement environmental conservation and protection overlay zones related to development permitting via PCC 33.430. Environmental zones protect resources and functional values that have been identified by the City as providing benefits to the public. The environmental regulations encourage flexibility and innovation in site planning and provide for development that is carefully designed to be sensitive to the site’s protected resources. These regulations also help meet other City goals, along with other regional, state, and federal goals and regulations. The environmental regulations also carry out Comprehensive Plan policies and objectives.
<p>2. Implement programs to protect riparian buffers and corridors, headwaters, springs and seeps, wetlands, and native vegetation.</p>	<ul style="list-style-type: none"> • The City continued to apply regulations intended to protect significant natural resources, including rivers, streams, drainageways, wetlands, riparian areas, forests and other special habitat areas. Five of the City’s overlay zones protect or conserve resources, functional values and/or significant wildlife habitat: Environmental Conservation (c), Environmental Protection (p), Greenway River Water Quality (q), Greenway River Natural (n) and Pleasant Valley Natural Resources (v). Three of the City’s overlay zones preserve and enhance the natural and scenic qualities of Portland’s rivers while allowing for specific uses within the zones: Greenway River Recreational (r), Greenway River General (g) and River Industrial (i). Additionally, City-approved Plan Districts, Natural Resource Management Plans and Comprehensive Natural Resource Plans may contain environmental protection regulations that supersede or supplement the overlay zones described above. Through the City’s review of land division applications, important streams, seeps and springs not already protected by environmental overlay zones were protected and maintained in their natural state within required platted tracts.

<p>3. Restore riparian buffers by removing invasive species and planting with native shrubs and trees.</p>	<ul style="list-style-type: none"> • In partnership with the SW Watershed Resource Center: <ul style="list-style-type: none"> • Facilitated the restoration (invasive removal, erosion control, and/or native planting) on 60 linear feet of streambank and 50 feet of slope above a streambank • Installed 964 native plants • Removed 5,496 square feet of invasive plants • Reduced stormwater runoff by at least 15,400 gallons per year to reduce soil erosion through amendments, installation of porous walkways, native plants and other stormwater management best practices • Supported the Johnson Creek Watershed Council’s 18th annual Johnson Creek Watershed-wide Restoration Event, where 283 volunteers planted 5,311 native trees and shrubs and cleared 800 square feet of invasive plant material. • In partnership with Portland Parks & Recreation and the Mt. Tabor Park Weed Warriors, used community volunteers to enhance over 7 acres of parkland. • Portland Parks & Recreation partnered with a number of non-profit, community groups, and schools to involve volunteers in the enhancement of natural areas. Volunteers worked 44,416 hours planting 23,401 native plants. • Under BES’s Community Stewardship Grants Program, awarded 13 stewardship grants totaling \$100,000 for projects that included planting approximately 5,346 native trees, shrubs, and groundcover. Also awarded 19 mini-grants totaling \$5,800. Mini-grants provided community groups and private property owners with native plant gift certificates for riparian and upland restoration and revegetation projects in all Portland watersheds. Approximately 1,450 trees, shrubs and groundcover were planted with mini- grants. • Under the City’s Watershed Revegetation Program, activities in FY 15/16 included planting of 11,555 trees and 36,966 shrubs along 9,935 linear feet of streambank covering 96 acres.
<p>4. Implement an invasive species removal program, including education and outreach.</p>	<ul style="list-style-type: none"> • The Portland City Council passed Resolution 36726 in August 2009 to establish the Invasive Plant Strategy as Portland’s management plan for invasive plants. The resolution directed the City to adopt the 10-year management goals outlined in the Invasive Plant Strategy report. In addition to prohibiting the planting of nuisance plants in natural resource overlay zones and City-required landscaped areas, the City established a Required Eradication List in Title 29, Property Maintenance. The intent of this rule is to control the spreading of highly invasive plants that have not yet become widespread in Portland. <p>See the list in response to Strategy 3 (above) for specific fiscal year projects.</p>

<p>5. Implement tree protection ordinances that provide stormwater benefits and mitigate urban heat island effects.</p>	<ul style="list-style-type: none"> Continued implementation of Title 11, Trees. Title 11 includes tree preservation and planting requirements on development sites and standardizes the City's tree removal permit system. These new regulations help to preserve, expand, regenerate, and improve the quality of Portland's tree canopy. Developed draft tree canopy targets for the Central City, as a part of the Proposed Draft of the <i>Central City 2035 Plan</i>. These targets will be achieved through policies, programs, and regulations in the plan. Twenty-year targets were generated for each sub-district within the Central City. These tree canopy targets will be updated further and finalized in FY 16-17. Effective January 2, 2015, the Bureau of Development Services (BDS) and Urban Forestry, Bureau of Parks & Recreation (UF/PP&R) began implementation of the City's new tree regulations contained in Title 11. All building permit applications submitted to BDS are reviewed for compliance with the requirements. The tree code also applies to non-development related tree planting/pruning/and removal on private property and in public right-of-way planting strips.
<p>6. Implement a Revegetation Program.</p>	<ul style="list-style-type: none"> Under the City's Watershed Revegetation Program, many public agencies, businesses, and other landowners participated in and helped fund revegetation projects on their properties and neighboring properties. The program is currently managing 1,397 project acres on both public and private property. In FY 2015-16, 11,555 trees (8,095 deciduous and 3,460 coniferous) were planted on 96 acres.
<p>7. Implement a street tree planting program.</p>	<ul style="list-style-type: none"> In partnership with Friends of Trees, planted 3,046 street trees and 706 yard trees in City of Portland right-of-way, on school properties, and in private yards.
<p>8. Work with watershed partners to support and coordinate tree planting and riparian restoration programs.</p>	<ul style="list-style-type: none"> Through Portland Parks & Recreation, partnered with a number of non-profits, community groups and schools to involve volunteers in their local natural areas. Activities include invasive plant species removal, native plant installation, trail building, installing fencing for sensitive resources, youth education, wildlife surveying and litter removal. In partnership with Portland Parks & Recreation and the Mt. Tabor Park Weed Warriors, used community volunteers to enhance over 7 acres of parkland. In partnership with Friends of Trees, planted 3,046 street trees and 706 yard trees in City of Portland right-of-way, on school properties and in private yards. In partnership with the SW Watershed Resource Center, facilitated restoration activities on 60 linear feet of streambank and 50 feet of slope above a streambank. This included installation of 964 native plants and removal of 5,496 square feet of invasive plants.

<p>9. Implement stream restoration projects and provide floodplain reconnection.</p>	<ul style="list-style-type: none"> • Acquired 1.2 acres in the Stephens Creek subwatershed, 2 acres in the Johnson Creek watershed, and 10 acres in the Columbia Slough watershed as part of the Grey to Green and Johnson Creek Willing Seller Programs. • Partnered with Portland Parks & Recreation to construct a stream enhancement project in the Ash Creek Natural Area/Taylor’s Woods portion of Dickinson Park. Construction started early April 2015 and was completed in fall 2015.
<p>10. Work with public and private partners on culvert replacement, stream and wetland restoration projects.</p>	<ul style="list-style-type: none"> • BES’s Community Watershed Stewardship Program awarded 13 stewardship grants and 19 mini grants in FY 2015-16, totaling \$105,800. Some of the projects included the Lents Springwater Habitat Restoration Project (\$9,875), Rose CDC Lents Youth Initiative (\$9,885), Linnton Neighborhood Association Restoration (\$6,200), Friends of Tryon Creek Environmental Education for All (\$8,700), Southwest Neighborhoods (SWNI) African Youth Community Organization (AYCO) Watershed Team (\$6,000), Columbia Slough Watershed Council (CSWC) Youth Leadership in Restoration (\$8,600) and 19 mini grants, totaling \$5,800, for native plants to help start or maintain projects beneficial to Portland watersheds, including stormwater management. • Completed pre-design and began design to restore failing culverts along Leif Erikson Drive in Forest Park. The project will replace non-functioning culverts that are a source of sediment to drainage basins that discharge to the Willamette River.
<p>11. Identify and protect cold water refugia in the Willamette River.</p>	<ul style="list-style-type: none"> • See Table 9 of this report.
<p>12. Use updates to the citywide Natural Resource Inventory to inform zoning and planning updates.</p>	<ul style="list-style-type: none"> • The City’s <i>Comprehensive Plan Update</i> requires periodic review and updating of the Natural Resource Inventory. In FY 2015-16, the City adopted the <i>2035 Comprehensive Plan</i>, which includes goals and policies, updated land use designations, and other citywide systems plans that will support watershed health throughout the city over the next 20 years. • Continued work on the <i>Central City 2035 Plan</i>, which sets a 20-year vision for the Central City and is a culmination of over 5 years of planning and public involvement. The plan includes a range of policies related to the climate change resilience, sustainable development, and management of the Willamette River and its adjacent uses, among others. An updated Natural Resources Inventory for the Willamette River was prepared as part of this effort.

Table 6. Structural Controls (STR)

Strategy	Implementation Activities FY 2015-16
<p>1. Implement retrofits to the existing storm drainage system, including use of green infrastructure.</p>	<p>The following retrofit projects were either in construction or were completed during FY 2015-16:</p> <ul style="list-style-type: none"> • Filter vault treating 2 acres of runoff from NE Columbia Blvd. • Four vegetated facilities treating runoff from NE 112th Ave. between NE Marx St. and the Slough. • Initiated construction of the Centennial Oaks Stormwater project in Willamette Park to treat 1.4 acres. <p>The following retrofit projects were in the design phase during FY 2015-16:</p> <ul style="list-style-type: none"> • Stormwater treatment in outfall basin 104B to treat 200 acres. • Green street on SW Palatine Hill Road/Corbett Lane. • SW Palatine Hill Rd/Lewis & Clark green street to treat 3,590 square feet. • Restore failing culverts along Leif Erikson Drive. • Phase 1 of a stormwater management improvement for the intersection of SW Shattuck and Beaverton Hillsdale Hwy. • SW 19th Ave stormwater facility and green street. • Two stream daylighting projects at Albert Kelly Park and Jackson Middle School.
<p>2. Identify, prioritize, and construct new stormwater management facilities.</p>	<ul style="list-style-type: none"> • The City has been designing and constructing stormwater management facilities since the beginning of the first MS4 permit term (1995) to reduce water quality impacts from development. Various City policies, programs, and plans facilitate the implementation of stormwater management facilities. • Capital Program: The Capital Improvement Program (CIP) includes a Surface Water Management program area. The CIP project list is developed through a multi-step process to identify, develop, review, score and rank projects for funding and scheduling priority. • The City has constructed lined swales and other stormwater management facilities under other City programs to treat stormwater from existing rights-of-ways in select areas to reduce TSS loadings. <p>See the list in response to Strategy 1 (above) for specific projects.</p>
<p>3. Maintain stormwater conveyance system maps and database to track system components and conditions.</p>	<ul style="list-style-type: none"> • BES continued to track assets, such as pipes and ancillary infrastructure, and the number, type, size, drainage area, and location of stormwater facilities constructed annually.

<p>4. Develop a comprehensive Stormwater System Plan.</p>	<ul style="list-style-type: none">• Continued work on the Stormwater System Plan, a multi-year project to fully define and plan for the City’s stormwater system needs.• Continued development of a citywide risk assessment which will inform the MS4 retrofit strategy.• Continued development of a citywide risk assessment for stormwater quality.• Continued development of a citywide risk assessment for approvable stormwater discharge points. Initiated development of citywide rapid assessments for a number of other risk categories. This initial pass will be iteratively improved over time.• Continued predesign of several water quality and flow control projects in the Stephens Creek watershed, in partnership with the Willamette Watershed team.• Continued preliminary design and community outreach to explore retrofit options for the underserved Errol Heights neighborhood in southeast Portland, in partnership with the Johnson Creek Watershed team.• Continued preliminary design and community outreach to explore retrofit options for Capitol Highway in southwest Portland, in partnership with the Fanno Tryon Watershed Team.
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Table 7. Program Management (PM)

Strategy	Implementation Activities FY 2015-16
<p>1. Develop annual reports by November 1 that provide an overview of the TMDL Implementation Plan status.</p>	<ul style="list-style-type: none"> • This FY 2015-16 TMDL Annual Report will be completed by November 1, 2016.

Table 8. Monitoring

Strategy	Implementation Activities FY 2015-16
<p>1. Implement a monitoring program that includes stormwater and surface water.</p>	<ul style="list-style-type: none"> • The Monitoring Compliance Report is published as part of the NPDES MS4 Permit Annual Compliance Report submitted to DEQ on November 1, 2016. Table B-1 in Schedule B of the 2011 NPDES permit summarizes required monitoring types, locations, frequency, and analytic parameters. The required monitoring information is included in Section 3 of the Annual Compliance Report. • In 2015, BES updated the Monitoring Plan that describes the City’s instream and stormwater monitoring activities for MS4 Permit compliance. The Monitoring Plan and associated sampling efforts were implemented at the beginning of FY 2016-17.

Table 9. Temperature Management Strategies

Strategy	Implementation Activities FY 2015-16
1. Riparian Protection	<ul style="list-style-type: none"> • In partnership with the SW Watershed Resource Center facilitated the restoration (invasive removal, erosion control, and/or native planting) on 60 linear feet of streambank and 50 feet of slope above a streambank including the installation of 964 native plants. • Through a BES/Portland Parks & Recreation partnership, involved citizens in their local natural areas, where 9,062 volunteers spent 44,416 volunteer hours on restoration activities. • Supported the Johnson Creek Watershed Council’s 18th annual Johnson Creek Watershed-wide Restoration Event, where 283 volunteers planted 5,311 native trees and shrubs and cleared 800 square feet of invasive plant material. • Under BES’s Community Stewardship Grants Program, 13 stewardship grants totaling \$100,000 for projects that included planting approximately 5,346 native trees, shrubs, and groundcover. The grants program also awarded 19 mini-grants totaling \$5,800 in FY 2015-16. Mini-grants provided a variety of community groups and private property owners with native plant gift certificates for riparian and upland restoration and revegetation projects in all Portland watersheds. Approximately 1,450 trees, shrubs and groundcover were planted with mini-grants. • Continued to protect riparian vegetation through natural resource inventories, protection plans, and environmental overlay zones.
2. Revegetation Program	<p>Willamette River</p> <ul style="list-style-type: none"> • Planted 11,323 plants on 18.5 acres. This included 250 deciduous trees, 460 coniferous trees, and 10,613 shrubs. <p>Columbia Slough</p> <ul style="list-style-type: none"> • Planted 12,920 plants on 6,096 linear feet of riverbanks on 50.4 acres. This included 4,705 deciduous trees, 550 coniferous trees, and 7,665 shrubs. <p>Johnson Creek</p> <ul style="list-style-type: none"> • Planted 17,463 plants on 2,237 linear feet of streambank on 19.5 acres. This included 2,565 deciduous trees, 1,825 coniferous trees, and 13,073 shrubs. <p>Tryon Creek</p> <ul style="list-style-type: none"> • Planted 1,850 plants on 270 linear feet of streambank on 2 acres. This included 125 deciduous trees, 125 coniferous trees, and 1,600 shrubs. <p>Fanno Creek</p> <ul style="list-style-type: none"> • Planted 4,965 plants 1,332 linear feet of streambank on 5.6 acres. This included 450 deciduous trees, 500 coniferous trees, and 4,015 shrubs.
3. Coldwater Refugia	<ul style="list-style-type: none"> • Continued planning on the <i>Powers Marine logjam structures</i>. This project is intended to build historic-scale logjams along a reach of state-owned submerged lands that are adjacent to property owned by Portland Parks & Recreation. The primary objective of the project is to enhance the value of BES’ Riverview asset of multiple cold-water inputs to the Willamette mainstem along the Powers Marine Park shoreline/shallow water habitat bench. During the summer and fall seasons when the mainstem temperature in the Willamette rises above optimum levels, the Riverview inputs become increasingly important as cold water sources of thermal refugia to many species of aquatic fish and wildlife. By building large logjam structures along the shoreline, this project is intended to expand the depth and breadth of the tributaries’ cold water mixing zones in the river, and increase resting, feeding and rearing

	<p>opportunities for Willamette fish and wildlife for years to come (designed for a 50+ year lifespan). Additionally, this project aims to increase the Riverview asset’s value by enhancing the existing riparian and floodplain zone’s plant community with native hardwoods, conifers, and shrubs so that the reach is guaranteed a supply of future woody debris for these and other logjams downstream.</p> <ul style="list-style-type: none"> Continued to participate in a multi-year partnership project on the Crystal Springs restoration effort with the Army Corps of Engineers, Portland Parks & Recreation and a coalition called the Crystal Springs Partnership. Crystal Springs is a spring-fed cold water stream and tributary of lower Johnson Creek. The Johnson Creek confluence is an important off-channel refuge for migrating salmon and Crystal Springs feeds uniform flows to Johnson Creek and the lower Willamette River. Restoration efforts along the length of the creek, including Westmoreland Park, has added large logs, root wads, and boulders to slow water and create pools for fish. Restoration included replacing old culverts with fish passable structures at Glenwood, Bybee, Tenino, and Umatilla streets, as well as a railroad bridge and streambank enhancement. Restoration has led to a maximum reduction in temperature of 3-degrees Celsius during summer months, eliminating a heat source to lower Johnson Creek. The value of Johnson Creek confluence area as a cold water refuge was highlighted in 2015 as dozens of adult salmon sought thermal refuge in Johnson Creek during the 2015 drought. Continued work on the Oaks Bottom Wildlife Refuge Tidal Restoration Project. The Oaks Bottom Wildlife Refuge is a 160-acre park with diverse habitats including an extensive floodplain located along the east bank of the Lower Willamette River at approximately River Mile (RM) 16 in southeast Portland. The project area is within the 100-year floodplain of the Willamette River, which is within the tidal zone of the Columbia River. Oaks Bottom offers a unique opportunity for a large, natural, tidally influenced floodplain and wetland area to be restored in the heart of the city. The channel is spring-fed and supplies cool water to the Willamette River. The purpose of the proposed action is to restore a more natural tidal hydrologic connection between Oaks Bottom and the Lower Willamette River, improve diverse fish and wildlife habitats, reduce non-native species populations, and provide unhindered fish passage into and out of Oaks Bottom. Currently the project is at 90% design and is a partnership Section 206 project with the Army Corps of Engineers. Construction of the project is planned for the summer of 2018. Continued planning for the Eastbank Crescent project at RM 13. BES was tasked with the habitat restoration component of the project. The project’s primary goals are to enhance and restore fish and wildlife habitat while improving near-shore and non-motorized river recreation. Habitat enhancement and restoration will seek to improve riverbank and near-shore habitat conditions, including riparian, beach, shallow-water habitat for the benefit of fish, wildlife and people. Three restoration options will be developed upon City review of the Existing Conditions Report that was recently produced. Completed construction on the Lower Columbia Slough Refugia project. Thirty-five engineered log jams ("ELJs") were installed in the Lower Columbia Slough to provide shelter and habitat for migrating salmon that are resting and feeding in the slough enroute to the ocean. The ELJs are large woody complexes with slash included to provide many interstitial spaces for juvenile fish to hide from predators. These habitat elements provide overall resiliency to this important off-channel migratory area. Three acres of riparian vegetation were also planted near City Outfall 60 on the south bank of the Lower Slough as part of this project to improve water temperatures and provide wooded habitat in the future.
<p>4. Land Acquisition</p>	<ul style="list-style-type: none"> Acquired 1.2 acres in the Stephens Creek subwatershed, 2 acres in the Johnson Creek watershed, and 10 acres in the Columbia Slough watershed as part of the Grey to Green Land Acquisition Program.