

# 2019 Annual Report Columbia Slough Sediment Program

January 2020

Prepared by:



# 2019 Annual Report

## Columbia Slough Sediment Program

Published: January 2020

Prepared by:



ENVIRONMENTAL SERVICES  
CITY OF PORTLAND  
working for clean rivers



State of Oregon  
Department of  
Environmental  
Quality

*This page intentionally blank.*

## Table of Contents

<b>1</b>	<b>Introduction and Purpose .....</b>	<b>1</b>
<b>2</b>	<b>DEQ Cleanup Site Activities .....</b>	<b>3</b>
	<b>2.1 Source Control .....</b>	<b>3</b>
	2.1.1 Lower Slough.....	3
	2.1.2 Middle Slough.....	5
	2.1.3 Upper Slough.....	6
	<b>2.2 Sediment Cleanup .....</b>	<b>6</b>
	2.2.1 Lower Slough.....	6
	2.2.2 Whitaker Slough .....	7
	2.2.3 Middle Slough.....	8
	<b>2.3 Settlement Negotiations.....</b>	<b>8</b>
	<b>2.4 Prospective Purchaser Agreements .....</b>	<b>8</b>
	<b>2.5 Natural Resource Fund .....</b>	<b>9</b>
	<b>2.6 Anticipated Cleanup Actions in 2020.....</b>	<b>10</b>
	2.6.1 Lower Slough.....	10
	2.6.2 Whitaker Slough .....	10
	2.6.3 Middle Slough.....	10
	2.6.4 Upper Slough.....	10
<b>3</b>	<b>City Columbia Slough Sediment Program Activities .....</b>	<b>11</b>
	<b>3.1 BES Stormwater Source Control Evaluation and Management .....</b>	<b>11</b>
	3.1.1 City Roadways / City Stormwater Outfall Projects .....	11
	3.1.2 Local Improvement District Projects .....	14
	3.1.3 Commercial / Industrial Facilities .....	15
	3.1.4 BES Stormwater Basin Characterization and Source Tracing Investigations	15
	<b>3.2 Columbia Slough Sediment Program Data Management Tool .....</b>	<b>19</b>
	<b>3.3 Long-term Monitoring .....</b>	<b>19</b>
	3.3.1 Slough-wide Fish Tissue Monitoring .....	19
	3.3.2 Slough-wide Sediment Monitoring .....	19
	3.3.3 2018-2019 Fish Advisory Activities .....	20
	3.3.4 Fish Advisory Signs .....	22
	<b>3.4 Sediment Characterization and Remediation .....</b>	<b>23</b>

**Table of Contents (continued)**

**4 Citywide Upland Programmatic Source Control Activities ..... 17**

**4.1 Municipal Separate Storm Sewer System (MS4) Discharge Permit .....17**

        4.1.1 Operations and Maintenance..... 18

        4.1.2 Industrial Stormwater Management..... 20

        4.1.3 Illicit Discharge Detection and Elimination Activities ..... 21

        4.1.4 New Development Standards ..... 22

        4.1.5 Structural Controls ..... 24

        4.1.6 Natural Systems ..... 24

        4.1.7 Public Involvement (Education and Outreach)..... 25

**4.2 Total Maximum Daily Loads .....28**

**5 References ..... 29**

## Acronyms and Abbreviations

BES	City of Portland Bureau of Environmental Services
BDS	City of Portland Bureau of Development Services
BMPs	best management practices
CEL	community engagement liaison
City	City of Portland
COPC	contaminant of potential concern
CSCC	Columbia Slough consolidation conduit
CSWC	Columbia Slough Watershed Council
DDD	dichloro-diphenyl-dichloroethane
DDE	dichloro-diphenyl-dichloroethylene
DDT	dichloro-diphenyl-trichloroethane
DEQ	Oregon Department of Environmental Quality
ECSI	DEQ Environmental Cleanup Site Information database
EPA	Environmental Protection Agency
ESPCP	Erosion, Sediment, and Pollutant Control Plan
IDDE	illicit discharge detection and elimination
IGA	Intergovernmental Agreement
LID	Local Improvement District
LTMP	long-term monitoring program
MCDD	Multnomah County Drainage District
MIP	City of Portland Maintenance and Inspection Program
MS4	Municipal Separate Storm Sewer System
NHNPDx	Neighbor Helping Neighbor Portland
NPDES	National Pollutant Discharge Elimination System
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
OF	outfall
OHA	Oregon Health Authority
O&M	operations and maintenance
PAH	polycyclic aromatic hydrocarbon
PAWMAP	Portland Area Watershed Monitoring and Assessment Program
PBOT	Portland Bureau of Transportation
PCB	polychlorinated biphenyl
PCC	Portland City Code
PPA	Prospective Purchaser Agreement
PP&R	Portland Parks and Recreation Bureau
ROD	Record of Decision
ROW	right-of-way
SCM	Source Control Manual
SIFT	screened inline flow-through traps
SLV	screening level value
SMF	stormwater management facility

## Acronyms and Abbreviations (continued)

SPCR	Spill Prevention and Citizen Response
SVOC	semi-volatile organic compound
SWOM	City of Portland Stormwater Operations Manual
SWMM	City of Portland Stormwater Management Manual
SWMP	City of Portland Stormwater Management Plan
TIP	TMDL Implementation Plan
TMDL	total maximum daily load
TSS	total suspended solids
WAP	Watershed Action Plan
WPCF	water pollution control facility
WQF	water quality facility
WWTP	wastewater treatment plant
UIC	underground injection control system (i.e., drywell)
UST	underground storage tank

## 1 Introduction and Purpose

The purpose of the 2019 report is to summarize annual activities and on-going programs implemented by the City of Portland (City) Bureau of Environmental Services (BES) and the Oregon Department of Environmental Quality (DEQ) to improve Columbia Slough sediment quality as identified under DEQ's 2005 Record of Decision (ROD). Since 2006, DEQ and BES have implemented a watershed management approach to address Columbia Slough sediment contamination through an Intergovernmental Agreement (IGA).

Partnership obligations under the current 2016 IGA include: stormwater source control and management at private properties and city managed properties, sediment characterization and remediation, long term monitoring, data management, fish advisory outreach and signage; and prepare annual reports.

This report emphasizes the notable fiscal year accomplishments, ongoing activities to improve watershed health, and agency work products. The fiscal year is the timeframe between July 1, 2018 and June 30, 2019. For copies of reports cited, please contact the:

- BES Columbia Slough Sediment Program manager: (503) 823-7580; or the
- DEQ Columbia Slough Sediment Project manager: (503) 229-5040.



Lower Slough: Placement of activated carbon adjacent to St. Johns Landfill.

*This page intentionally blank.*

## 2 DEQ Cleanup Site Activities

DEQ is currently overseeing source control and cleanup actions at approximately 20 sites in the Columbia Slough Watershed. Site evaluations are performed to assess stormwater at upland sites to determine whether stormwater discharges are contributing to adverse impacts in Columbia Slough and determine appropriate upland source control actions. DEQ is also working to implement several in-water sediment cleanups. DEQ project status and information can be found in the DEQ Environmental Cleanup Site Information (ECSI) database<sup>1</sup> for the Columbia Slough Project (ECSI #1283) or individual cleanup sites.

### 2.1 Source Control

Upland source control actions completed, under DEQ oversight, in 2019 included stormwater treatment improvements and removal of source contamination at private properties and site investigations. DEQ-required source control evaluations and source control actions at selected upland sites discharging to the Slough are conducted in accordance with DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (DEQ, 2010). 2019 highlights include:

#### 2.1.1 Lower Slough

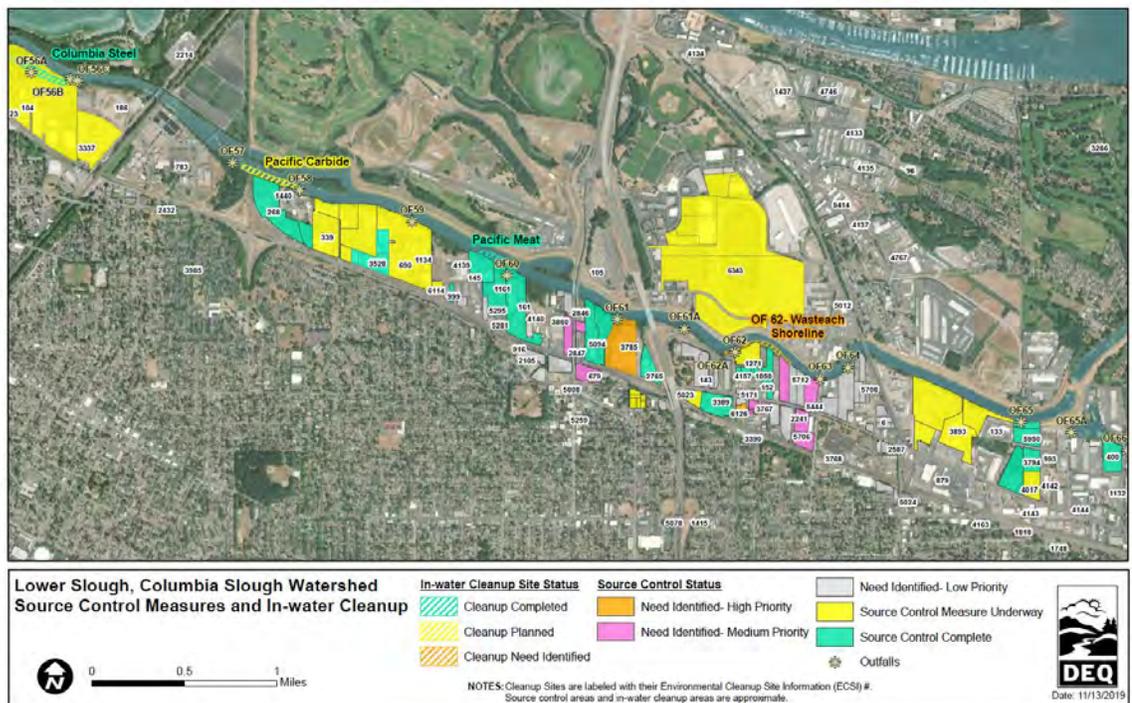
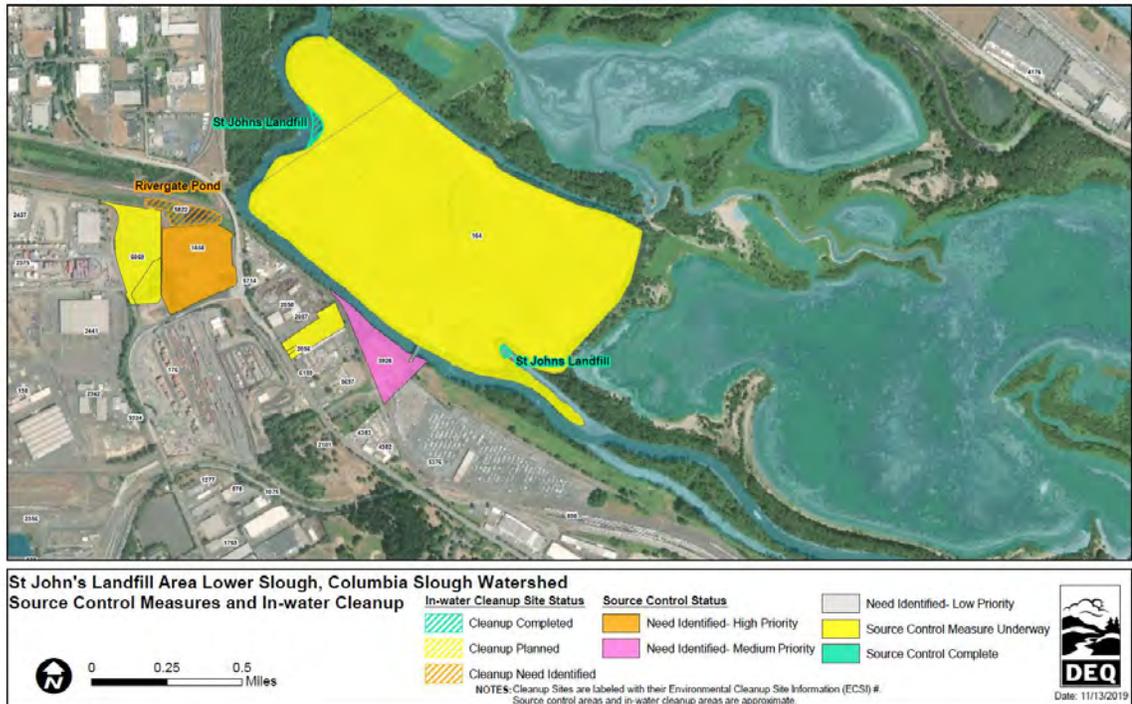
- Larsen South (#3337<sup>2</sup>). In February, BES discovered site stormwater discharging to city infrastructure and Columbia Slough, in violation of City Code and DEQ's Prospective Purchaser Agreement. In May 2019, the site's stormwater lines were plugged. The site owner will repair its onsite stormwater infrastructure and collect Columbia Slough sediment under DEQ review and approval.
- PGE Rivergate (#6069). Installed stormwater detention basin and other source control measures at PGE substation to reduce stormwater flow to the Columbia Slough.
- Schnitzer Property (#1050). 21<sup>st</sup> Century Towing redeveloped property and complies with DEQ easements. Concerns generally directed towards vapor mitigation, but stormwater management on site will be developed per city code through implementation of lined vegetative swales.
- Hanson Pipe (#3893). Site redevelopment installing additional stormwater improvements per city Stormwater Management Manual.
- Columbia Steel (#104). Remaining upland source control measures implemented, including soil capping and catch basin sediment removal.
- Kostas Scrap Metal (#6126). Entered voluntary cleanup program and performing a source control evaluation.
- Oregon Department of Transportation (ODOT) Maintenance Yard (#5023). Implemented source control measures at their yard.
- Rose Auto Wrecking (#5706). The site was evaluated under DEQ site assessment program. Results are pending.

---

<sup>1</sup> Site specific information and project status can be obtained from DEQ's ECSI database at <https://www.deq.state.or.us/lq/ecsi/ecsiquery.asp?listtype=lis&listtitle=Environmental+Cleanup+Site%20Information+Database>

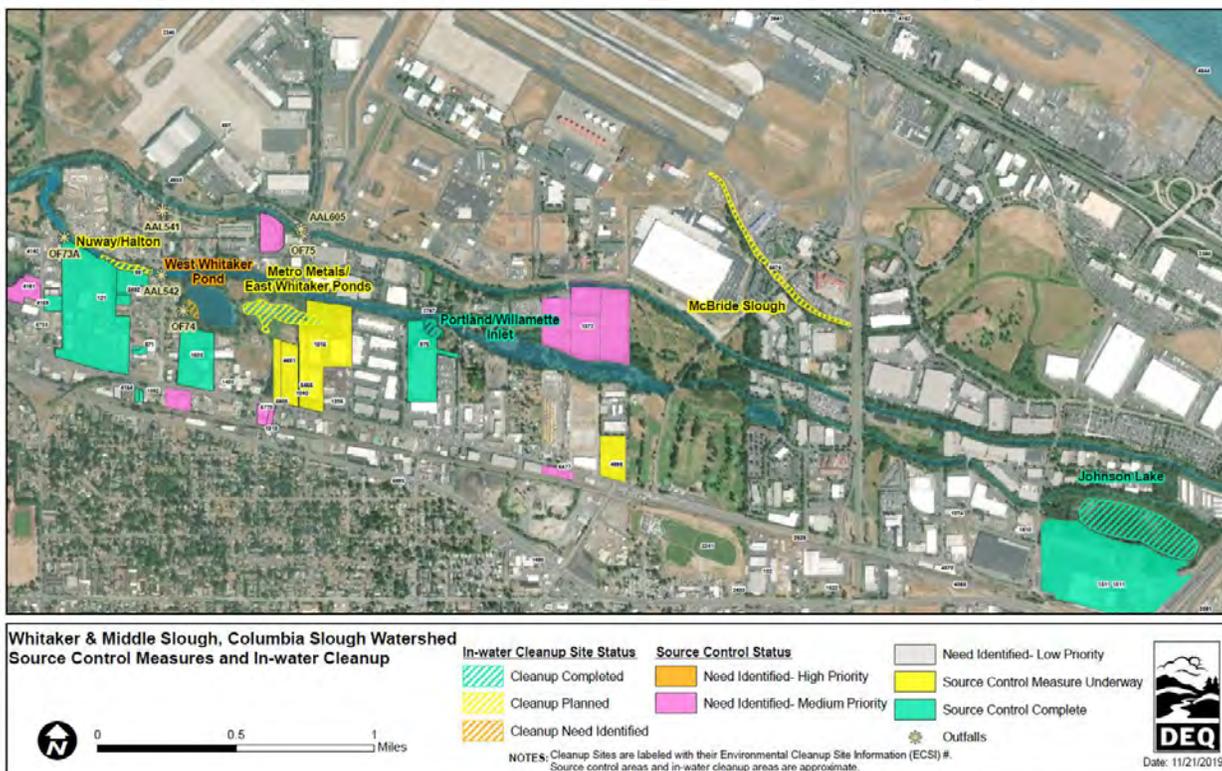
<sup>2</sup> Indicates DEQ's ECSI site identification number

- Former Goodyear Distribution Center (ECSI# 2105). The site was evaluated under the DEQ Site Assessment Program. Site redevelopment has occurred since the ECSI listing. The footprint of the new office building likely covers the location of the former underground storage tanks (USTs) and polychlorinated biphenyl (PCB) spill. The site is a low priority for additional source control evaluation.



### 2.1.2 Middle Slough

- DEQ entered into a Prospective Purchaser Agreement (PPA) with the Oregon Humane Society for the Steelman Enterprises (#4017) property. Work plan development occurred to implement future source control activities.
- Sapa, 7933 NE 21st Ave (#400). The site collected surface stormwater discharges to the Whitaker Slough and performed quarterly groundwater sampling to monitor effectiveness of the 2015 subsurface soil/sludge removal, conducted to reduce mobilized metals making their way to the slough. Source Control Decision issued December 2019.
- McBride Slough (#5676). Port of Portland continues to evaluate stormwater source control at Portland International Airport in areas that drain to McBride Slough. A specific type of pavement sealant was discovered as a significant source of elevated polycyclic aromatic hydrocarbons (PAHs). The Port is implementing actions to address PAH sources over the next four years. In 2019, impacted pavement south of the short-term parking lot was removed.
- Economy Auto Parts at 6909 NE 47th Avenue was evaluated under DEQ’s site assessment program. Results are pending.
- Columbia Environmental (#4392). City of Roses fulfilled PPA terms which included development and implementation of a Contaminated Media Management Plan, and payment of \$10,000 to DEQ for resolving potential liability associated with potential off-site contamination. A sampling and analysis plan will be developed to determine if a release of hazardous substances is present in the drainage ditch located on the north side of the property.



### 2.1.3 Upper Slough

- Blue Lake Corporate Park (#6189). Blue Lake LLC is working towards source control requirements. Impacted soils were removed and covering of remaining minimally impacted surface soil is in progress.

## 2.2 Sediment Cleanup

Characterization and cleanup of sediment contamination is completed either by private parties or by DEQ using funds from settlements with parties that contributed to Slough sediment contamination.

Sediment characterization/cleanup highlights for 2019 include the following:

### 2.2.1 Lower Slough

- South Rivergate Pond (#5822). In 2018, the U.S. Environmental Protection Agency (EPA) collected sediment samples to determine extent of sediment contamination in South Rivergate Pond and potentially the Columbia Slough. In 2019, EPA reported that samples collected indicate the presence of PCBs, metals, pesticides, and semi-volatile organic compounds (SVOCs) at significant concentrations in Pond sediments and Columbia Slough sediments where Pond water discharges to the Slough. EPA will continue as lead agency.
- Columbia Steel (#104). The site placed activated carbon at onsite wetlands along with limited sediment removal in 2018. Follow up monitoring in 2019 confirmed native plant growth (including Wapato) within the source removal area. The wetlands are connected to the Slough during seasonal periods of high water.
- Pacific Carbide, 9901 N Hurst Ave (#268). DEQ implemented a Data Gaps Investigation collecting additional information to support a 50% remedial design plan for impacted sediment along the banks of Pacific Carbide.
- St Johns Landfill (#164). In October 2019, Metro treated approximately 1.8 acres of impacted mudflats adjacent to the landfill. Activated carbon was applied by helicopter, a novel implementation approach.



Lower Slough: Placement of activated carbon adjacent to St. Johns Landfill.

### 2.2.2 *Whitaker Slough*

- Halton / Nuway (#121 / #88). DEQ prepared a Presumptive Remedy Proposal Technical Memorandum. Additional treatment is required to meet Columbia Slough sediment objectives.
- Metro Metals/East Whitaker Pond (#5455). Remedial Design/Remedial Action Work Plan finalized in March 2018. Remedial design in progress which will implement dredging, capping and habitat improvements in summer 2020.

### 2.2.3 Middle Slough

- McBride Slough (#5676). Dredging and activated carbon/sand cap placement completed by Port west of NE Alderwood Rd. A portion of the slough east of NE Alderwood Rd. was dredged and capped in 2019. Project completion is expected in 2020.



McBride Slough: Sediment transfer from barge to truck loading area

## 2.3 Settlement Negotiations

DEQ is actively discussing Columbia Slough settlements with several parties. Settlements will be announced under public notices with a public comment period. Settlements were finalized at Hanson Pipe (#3896), Oregon Humane Society/Steelman (#4017), and Columbia Steel (#104) in 2019.

## 2.4 Prospective Purchaser Agreements

Prospective Purchaser Agreements (PPAs) are tools to expedite the cleanup of contaminated property and encourage property transactions that otherwise might not occur because of the liabilities associated with purchasing a contaminated site. In the Columbia Slough area, PPAs generally require upland source control evaluation and a contribution to the Columbia Slough remedial fund. Three PPAs were signed within the Columbia Slough basin including Portland Meadows (#6343), and MB Terminal (#339).

## 2.5 Natural Resource Fund

DEQ, in collaboration with Oregon Department of Fish and Wildlife (ODFW), developed an option for private parties to settle for state natural resource damages associated with contaminant-related impairment of the Columbia Slough. The basic settlement amount associated with natural resource damages to the slough has remained the same since 2009. In October 2019, DEQ increased the settlement amount in consideration of two factors: cost inflation and nominal ODFW oversight costs. The payments are dedicated to habitat improvements within the slough. Work continues on the following projects:

- Multnomah County Drainage District (MCDD) to reduce invasive plant species, revegetate and improve Blue Heron Wetlands and Columbia Children's Arboretum. Settlement funds will contribute up to \$129,700. The work is approximately 60% complete.
- Portland Parks and Recreation (PP&R) to improve Whitaker Ponds Nature Park. Improvements include reduction of invasive terrestrial and aquatic plants, install understory plants and convert a small grassy field into forest. The ponds provide important native turtle habitat along with excellent turtle viewing opportunities. Settlement funds will contribute up to \$55,000. Work is expected to continue until 2021.



Work Crew pulling non-native plants at Blue Heron Wetlands

## 2.6 Anticipated Cleanup Actions in 2020

Sediment cleanup and upland source control actions that are anticipated to occur in 2020 include:

### 2.6.1 Lower Slough

- DEQ will continue preparing for hot spot sediment cleanup adjacent to Pacific Carbide.
- Columbia Slough Sediment characterization will occur between approximately North Denver Avenue and North Vancouver Avenue hot spot adjacent to OF 62 and near the former MB Terminals site.
- Blasen (#3785) will begin upland stormwater improvements.
- Hanson Pipe (#3893) stormwater improvements will be implemented during site redevelopment activities.
- DEQ Site Assessment activities will be completed at Rose Auto Wrecking (#5705).
- Columbia Steel (#104) will perform source control confirmatory sampling.

### 2.6.2 Whitaker Slough

- Halton (#121) and Nuway Oil (#88) DEQ will prepare a Data Gaps Plan collecting additional information to support a 50% cleanup design plan.
- Metro Metals (#5455) will implement East Whitaker Pond sediment cleanup.
- Steelman Enterprises (#4017) will implement upland source control evaluation and improvements.

### 2.6.3 Middle Slough

- McBride Slough (#5676) will complete remaining sediment cleanup along with continued upland source control at Portland International Airport.

### 2.6.4 Upper Slough

- Blue Lake Corporate Park (#6189) will cap surficial soils.

### 3 City Columbia Slough Sediment Program Activities

The City of Portland implements activities to fulfill the requirements of the 2005 DEQ Columbia Slough Sediment ROD and the 2016 IGA between DEQ and the City. These activities directly or indirectly reduce pollutant discharges via the stormwater pathway to the Columbia Slough and contribute to improving sediment and fish tissue quality and watershed health. City actions performed to comply with other DEQ city-wide permits or IGAs are described in Section 4.

This section specifically provides an overview of the activities performed to fulfill the requirements of the City's IGA and conducted in accordance with the *Columbia Slough Sediment Program Watershed Action Plan (WAP; 2011)* and the *Columbia Slough Watershed Long-term Monitoring Program (LTMP; 2007)*.

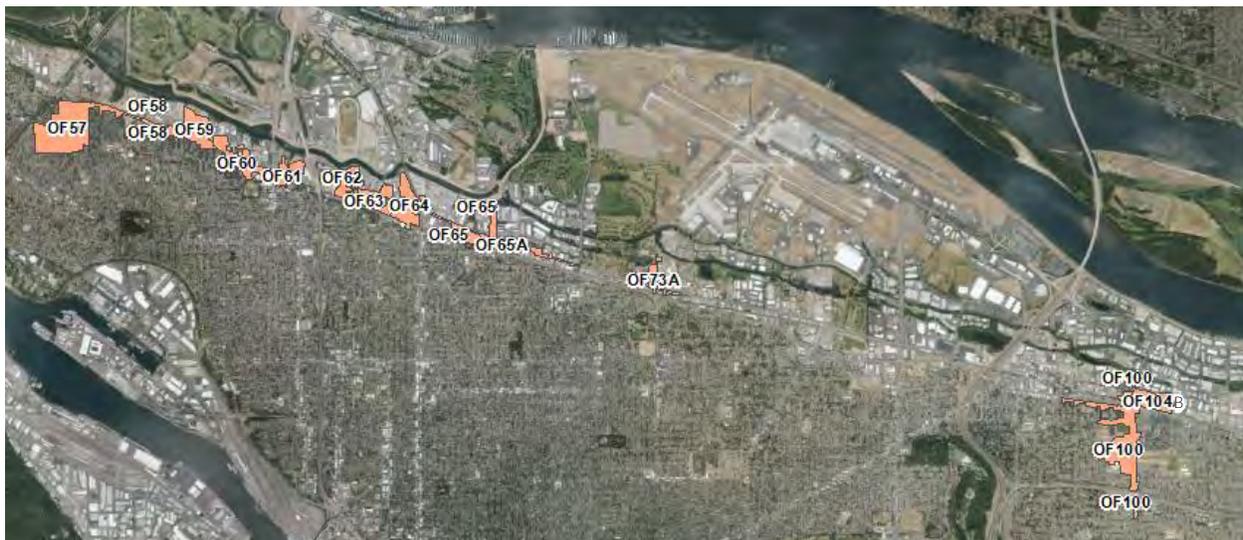
The activities completed in the 2018-2019 (July 1, 2018 – June 30, 2019) fiscal year (FY19) and planned activities for the 2019-2020 (July 1, 2019 – June 30, 2020) fiscal year (FY20) are described in the following sections.

#### 3.1 BES Stormwater Source Control Evaluation and Management

BES upland stormwater source control evaluation and management activities conducted in 2018-2019 are described in the following sections below.

##### 3.1.1 City Roadways / City Stormwater Outfall Projects

The City is working to treat stormwater runoff from selected City roadways in accordance with the ROD, IGA, and WAP within selected City stormwater basins. BES is currently working on numerous stormwater outfall basin projects to improve water quality, and where possible, reduce the volume of stormwater runoff making its way to the Slough via the City's stormwater conveyance system. The locations of active stormwater treatment projects are shown in the map below.



The City's work is being accomplished under several BES programs including: engineering pre-design and design; Columbia Corridor Stormwater Program; construction; and local improvement district projects. Work in each program area is described below.

### *3.1.1.1 Engineering Pre-Design/Design*

The status of the BES stormwater Pre-Design/Design treatment projects, in fiscal year 2019, are described below:

**Outfall 57:** BES continued developing stormwater treatment alternatives for Outfall Basin 57. The basin drains approximately 115 acres (35 acres of City right-of-way [ROW]) and discharges to the Lower Slough. The basin is comprised mostly of residential properties in the Portsmouth neighborhood and City roadways, including a  $\frac{3}{4}$  mile section of Columbia Boulevard. Construction is planned in FY2021. BES has initiated community outreach. Design has been delayed allowing treatment options for the section Columbia Boulevard near the Treatment Plant to be value engineered and potential stormwater trading options to be evaluated.

**Outfall 100:** BES continued developing stormwater treatment alternatives for Outfall Basin 100. The basin drains approximately 10 acres in the Parkrose Neighborhood; 25 acres of which are City ROW, and discharges to Whitaker Slough. The basin is comprised of residential properties, City and ODOT roadways, Parkrose High School, and about 3 acres of actively farmed land. Completed design includes treatment of approximately 15 acres of City ROW. BES community outreach initiated. Funding was by City Council approved in Fall 2019 and construction is scheduled to start Spring 2020.

**Outfalls 58, 59, 60, 61, 61A, 62, 62A, 63, 64, 65, 65A and 73A:** Basin delineation refinement and stormwater subcatchment modeling was completed in each basin. Pre-Design activities were initiated in these basins. Design and construction of the stormwater treatment systems will be phased over time to accommodate the scale, complexities and significant costs of these actions. Pre-design/design activities will continue in 2020 concurrent with consideration of potential alternative source control solutions being developed under the Columbia Corridor Stormwater Program described in Section 3.1.1.3 below.

The City of Portland's approach to stormwater management emphasizes the use of vegetated surface facilities to treat and infiltrate stormwater. Infiltrating stormwater with vegetated surface facilities is a multi-objective strategy that provides several benefits, including but not limited to pollution reduction, volume and peak flow reduction, and groundwater recharge. These benefits play a critical role in protecting stormwater infrastructure and improving watershed health.

### 3.1.1.2 Construction

**OF104B:** Construction was completed in March 2019 to provide stormwater treatment in Outfall Basin 104B. The basin drains nearly 200 acres (30 acres are City ROW) in the Argay Neighborhood and discharges to the eastern end of Whitaker Slough. The basin is comprised mostly of residential properties, including about 23 acres of actively farmed land and City and ODOT roadways. The treatment system consists of more than 50 curb extension-style vegetated stormwater facilities along the higher traffic roadways (Shaver St., Prescott Dr., 125th Pl., 131st Pl., and 133rd Ave.) within the basin. Approximately 26 acres of City ROW is treated. Effectiveness monitoring will be performed in 2019-2020.



Green street treatment facility under construction in Outfall 104B Basin adjacent to active farmland

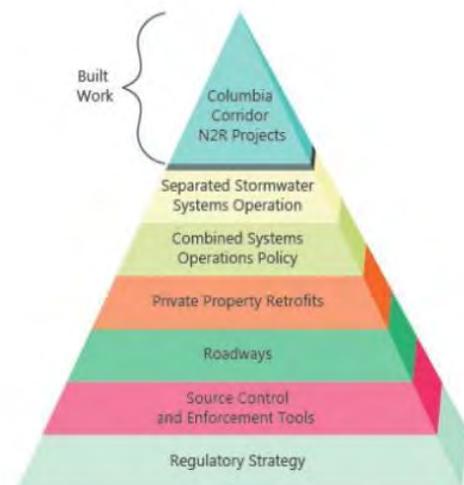
**OF77A:** Right of way treatment constructed and in operation. Effectiveness monitoring in progress and will continue in 2019-2020.

### 3.1.1.3 Columbia Corridor Stormwater Program

The BES Columbia Corridor Stormwater Program brings different City groups and programs together to develop solutions and alternatives for treating stormwater in some of the more challenging stormwater outfall basins in the Columbia Slough watershed. Challenging basins may have one or more of the following conditions: constrained ROW; unimproved roadways/properties; heavy industrial land use; sediment/contaminant tracking from private property into the ROW; and/or stormwater run-on from private property into the ROW.

The Columbia Corridor Stormwater Program's ongoing work is:

- Developing solutions to address stormwater outfall basin challenges identified through BES' design process;
- Exploring options or alternatives to improve the quality of stormwater reaching the Slough;
- Exploring options for discharging stormwater from Columbia Boulevard to the Columbia Slough Consolidated Conduit (CSCC) system with subsequent treatment at the Columbia Boulevard Wastewater Treatment Plant in exchange for removal of stormwater



from the City's combined sewer system discharging to the CSCC (i.e., stormwater exchange).

- Developing a hierarchical risk-based Capital Improvement Project delivery model that meets multiple regulatory requirements for stormwater treatment;
- Optimizing the use of ratepayer dollars for capital and operating investments; and
- Providing equitable service to our customers.

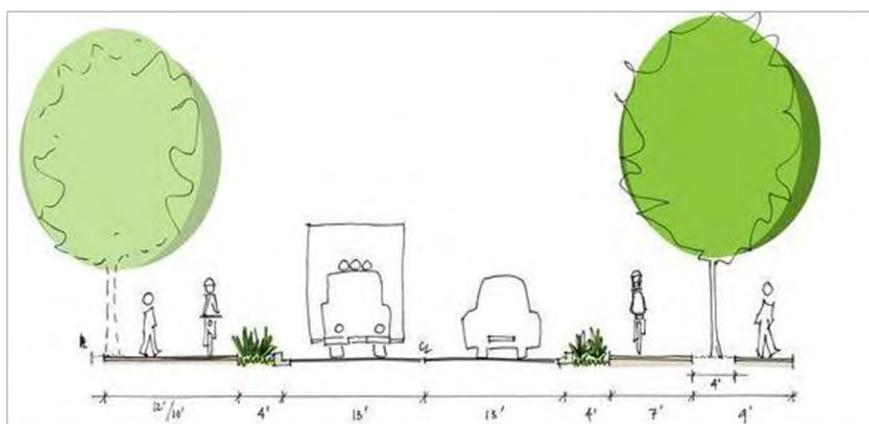
The alternative solutions being developed under the Columbia Corridor Stormwater Program will be considered during the predesign/design of stormwater treatment alternatives described above.

### 3.1.2 Local Improvement District Projects

A Local Improvement District (LID) is a method by which a group of property owners can share in the cost of infrastructure improvements, most commonly for street improvements including sidewalk and stormwater infrastructure. The City then manages the design and construction of the project.

#### 3.1.2.1 NE 47th Avenue Phase I LID (Outfalls AAL542, AAL552 and ANF554)

The Portland City Council formed a Local Improvement District (LID) for NE 47th Avenue between NE Columbia Boulevard and NE Cornfoot Road on April 6, 2016. This project will include treatment of stormwater runoff within the right-of-way of the project area and the planting of approximately 63 street trees. Funding for this project is being provided by PBOT, BES and property owners participating in the LID. Construction is scheduled for Fall 2019 through Fall 2020.



NE 47<sup>th</sup> Avenue Phase I LID typical cross section

#### 3.1.2.2 NE 46th Avenue & Bryant Street LID

The Portland City Council formed a LID for regrading an existing gravel street that connects NE 47th Ave. with NE 46th Ave and constructing a concrete street with aggregate base and stormwater facilities. The LID area drains to Whitaker Slough via private outfalls. The street improvements and installation of new street will require BES to install a new city outfall that will drain to Whitaker Slough near the NE 47<sup>th</sup> Avenue bridge.

### 3.1.3 Commercial / Industrial Facilities

The City's source investigation and control efforts help: identify significant upland sources discharging to City stormwater pipes or directly to the Slough; and facilitate or require actions to address stormwater management practices at identified sites. These actions include:

- **Industrial Stormwater Permit Administration** (See Section 4): The City continues to work under DEQ authority to administer the NPDES 1200z Industrial Stormwater Permits<sup>3</sup> Program city-wide. The City identifies permitted and unpermitted upland discharges to the city stormwater system and makes recommendations regarding source control measures as appropriate to reduce pollutants entering the City system from permitted and unpermitted sites in the Slough.
- **Technical Assistance** (See Section 4). BES conducts stormwater inspections for permitted and unpermitted facilities, issues no exposure certifications, and provides technical assistance to upland property owners.
- **Stormwater Pathway Evaluations**: DEQ and the City work together to assess sites that require stormwater pathway evaluations to identify contaminants entering the City stormwater system.
- **BES Stormwater Basin Characterization and Source Tracing Investigations**: BES performs stormwater sampling and analyses to assess stormwater quality discharging to the Slough and to identify (see Section 3.1.4 below).

### 3.1.4 BES Stormwater Basin Characterization and Source Tracing Investigations

The City and DEQ continue to collaborate on stormwater basin specific source investigations and Control efforts to identify the actions and timelines needed to control any known or suspected significant pollutant sources. This work includes City sampling of solids and stormwater in priority basins and using the resulting data to focus source identification and control efforts. BES collects samples from City outfall basins to:

- Characterize City stormwater basin discharges
- Identify potential upland sources (e.g., upland facilities) discharging to the City stormwater system
- Prioritize basins for further source tracing investigations or source control action
- Support DEQ cleanup actions in the Columbia Slough

#### 3.1.4.1 2016-2018 Sampling Results

BES continued source tracing sampling of stormwater and stormwater solids to identify areas or upland facilities that may discharge pollutants at elevated concentrations to the City stormwater conveyance system and to characterize City outfall stormwater discharges. The 2016-2017 (FY17) sampling effort involved the collection of stormwater and stormwater solids<sup>4</sup> from six stormwater outfall basins between October 2016 and June 2017. The 2017-2018 (FY18) sampling effort involved the collection of stormwater samples from 19 outfall basins between

---

<sup>3</sup> Formerly, called the NPDES Columbia Slough (NPDES-COLS) permit until 2017

<sup>4</sup> For the purposes of this report, "stormwater solids" refers to samples collected from upland locations, such as within stormwater lines from screened inline flow-through traps (SIFT®), manholes, or catchbasins, curb sediment, or erodible surface soils. "Sediment" refers to samples collected from in-water locations.

October 2017 and June 2018. Facilities identified through source tracing may be required to obtain a NPDES 1200z industrial stormwater discharge permit or implement upland source control measures under DEQ's environmental cleanup authority.

Basin characterization sampling results collected between October 2016 (2016-2017) and June 2018 (2017-2018) are presented in the 2016-2017 and 2017-2018 Source Tracing Investigation and Basin Characterization report, submitted to DEQ in May 2019. Findings and conclusions of the basin assessment and source tracing categorization activities include:

- Some analyte concentrations detected in City outfall basins are less than DEQ screening level values (SLVs) and/or NPDES 1200z benchmarks.
- Copper, lead, and zinc concentrations were noted to exceed DEQ's current industrial NPDES 1200z permit benchmark concentrations in some City outfall basins. Exceedance of these benchmarks suggests evaluation is needed to determine if additional permits should be issued to upland industrial facilities in these basins or if source control may be needed at upland sites.
- Assessment results for Basins 56C, 73A, 74, and 77 indicate that further source tracing is needed. In these basins, PCBs, metals, pesticides, and other analytes were identified that indicate the potential for significant uncontrolled sources and may require additional source tracing.
- Eight City outfall (OF) basins (OF54, 55A, 57, 59, 63, 100, 104A, 104B), are classified as less likely to have significant unidentified or uncontrolled sources.
- City outfall basins with significant (i.e., > 10 times SLVs) stormwater analyte concentrations typically have known or potential upland sources (OF56C, 61, 62, 62A). Many of these upland sources are in the process of conducting source control evaluations or source control measures under DEQ oversight (BES, 2016a, 2016b, 2016c).

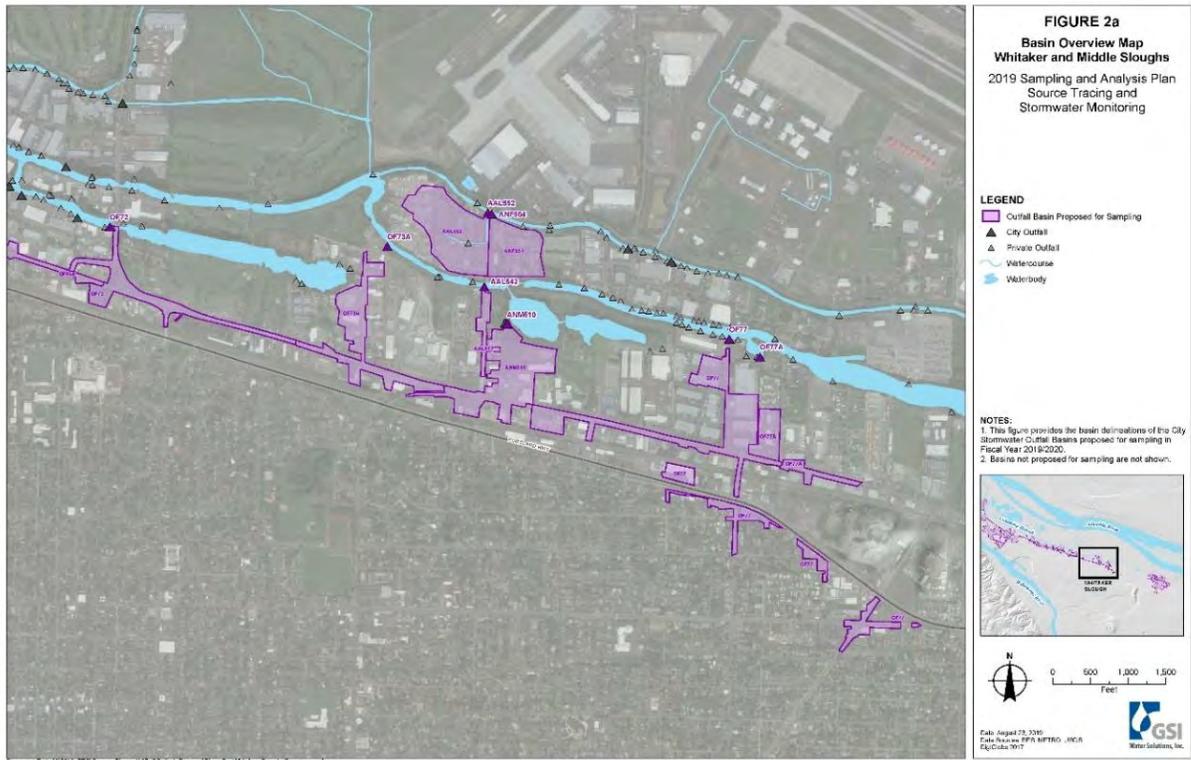
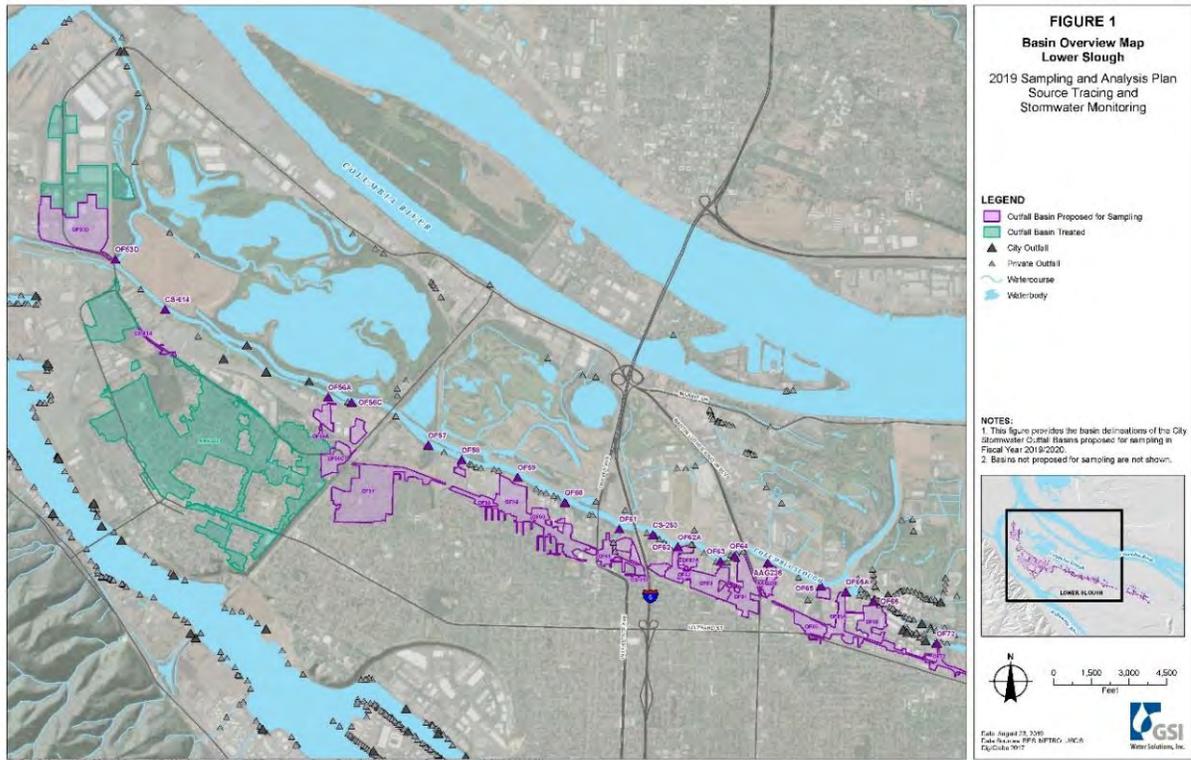
#### *3.1.4.2 2018-2019 Sampling Results*

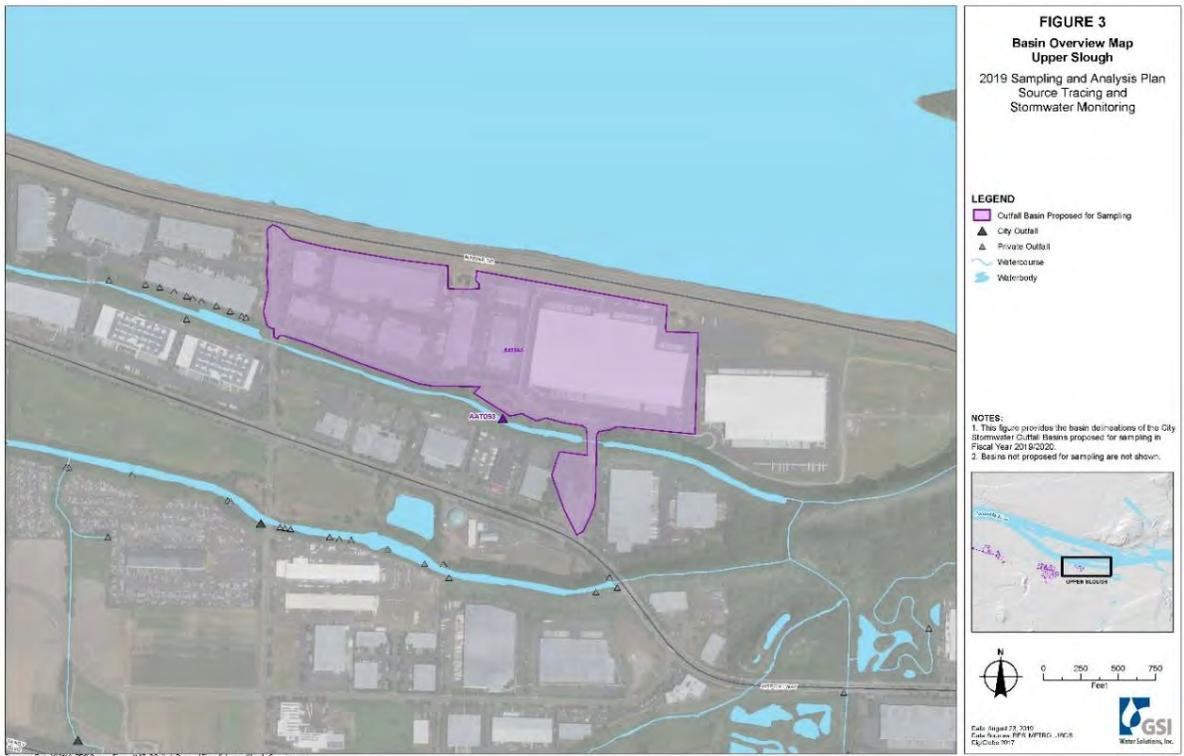
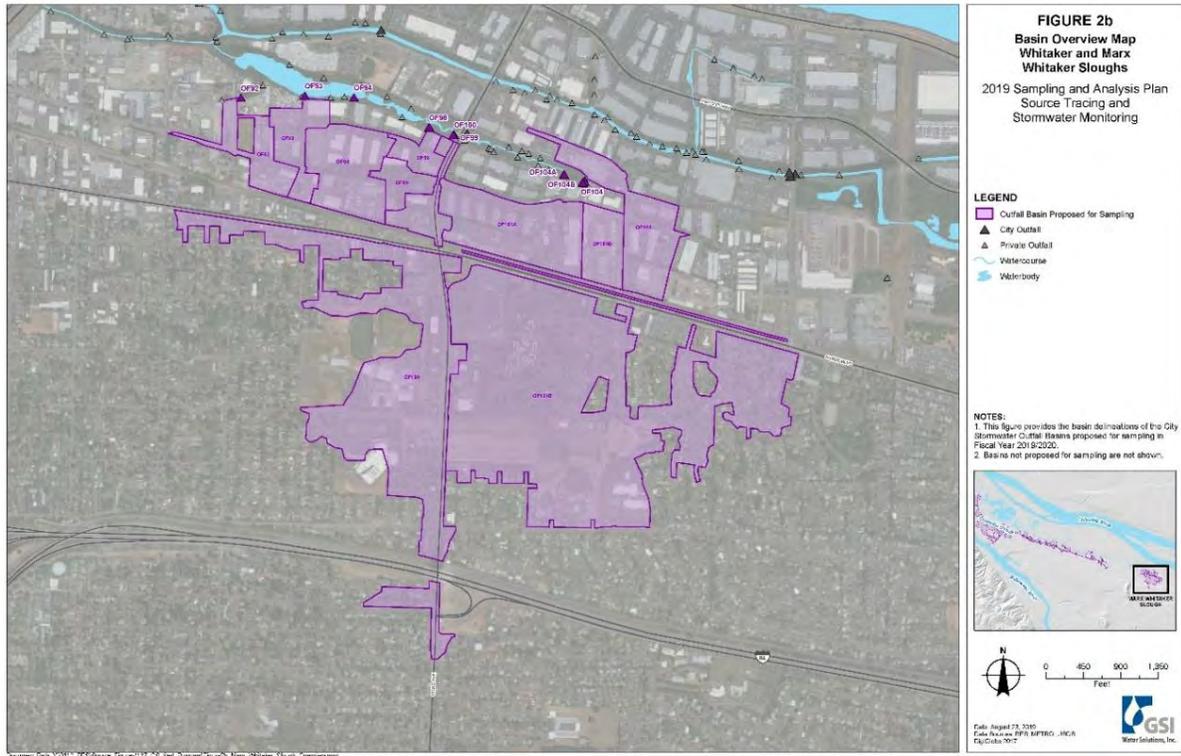
Thirty-seven City outfall basins were targeted for collection of stormwater samples between October 2018 and June 2019. The basin sampling is described in the *2018 Sampling and Analysis Plan* submitted to DEQ in September 2018. Stormwater results are currently being evaluated and the *2018-2019 Stormwater Data Report* is targeted for submittal to DEQ in Winter 2020.

#### *3.1.4.3 2019-2020 Sampling Plan*

Thirty-six City outfall basins are targeted for collection of stormwater samples between September 2018 and June 2020. The basin sampling is described in the *2019 Sampling and Analysis Plan* submitted to DEQ in August 2019. The locations of outfall basins proposed for sampling shown in the following figures.

Stormwater sampling results will be submitted to DEQ in Fall 2020.





## 3.2 Columbia Slough Sediment Program Data Management Tool

Numerous environmental investigations have been conducted overtime by BES, DEQ, the Multnomah County Drainage District, and other parties to assess contaminant levels in the Slough. The abundance of environmental data and various storage methods resulted in a need for a single data management tool to assist with data access, data evaluation, and data mapping. BES developed and maintains the Columbia Slough Database to facilitate access, analysis and mapping of data from over 25 years of environmental monitoring in the Columbia Slough. Soil, sediment, stormwater, stormwater sediment, fish tissue, surface water, and other media are included in the database.

In December 2018, BES submitted an updated Columbia Slough Data Management Framework to DEQ. Refinements and improvements are made to the database on an ongoing basis and new data is uploaded. Data that was added to the database in 2018-2019 includes: 1) 2016-2017 BES stormwater data, and 2) 2017-2018 BES Stormwater data.

In 2019-2020, the City will continue database refinements and uploading of the 2018-2019 stormwater data and other data as available.

## 3.3 Long-term Monitoring

The 2007 *Columbia Slough Long Term Monitoring Plan* (LTMP) and IGA describe actions the City implements to measure the long-term health of the Slough, and to assess the effectiveness of actions being implemented to reduce sediment contamination levels. The LTMP describes the long-term monitoring performed by the City of fish tissue and sediment quality. Data generated by this monitoring provides the basis for adaptive management of the Slough. The last Slough-wide fish tissue sampling event was completed in 2015 and the last Slough-wide sediment event was completed in 2017 and are summarized below.

In addition, the LTMP and IGA describe actions the City will perform to take to identify angler activity in the Slough and whether fish advisory outreach efforts need to be intensified or otherwise modified. The City's actions on the Columbia Slough fish advisory in 2018-2019 are described in Section 3.3.3, below.

### 3.3.1 Slough-wide Fish Tissue Monitoring

BES completed the third round of Slough-wide fish tissue sampling in 2015. As described in the LTMP, fish tissue is collected every ten years. The tissue samples were analyzed for polychlorinated biphenyls, pesticides, metals and dioxins. The Fish Tissue Data Report was submitted to DEQ in September 2017. The Fish Tissue Data Report was revised to address DEQ comments and was submitted to DEQ in June 2018.

Fish tissue results suggest that metals and pesticide concentrations in fish tissue are declining; while PCB concentrations have remained consistent over time. Fish data were submitted to the Oregon Health Advisory (OHA) to update the Columbia Slough Fish Advisory. The updated advisory was issued by OHA on December 11, 2019.

### 3.3.2 Slough-wide Sediment Monitoring

As described in the 2007 *Columbia Slough Long Term Monitoring Plan* (LTMP), sediment is collected every ten years. The third round of sediment samples were collected in April through June 2017. Sediment samples were analyzed for PCB Aroclors, pesticides, PAHs, phthalates,

and metals. A subset of 20 sediment samples were analyzed for PCB congeners and a subset of 10 samples were analyzed for dioxins/furans. The 2017 *Columbia Slough Sediment Data Report* was submitted to DEQ in June 2018 and DEQ provided comments in October 2018. Key findings of the 2017 sediment sampling event include:

- **Contaminants of potential concern (COPC), defined based on the protection of human health (i.e., fish consumption) and the environment (e.g., toxicity), have remained consistent over time.**

Sediment contaminants identified at concentrations above DEQ screening level values (SLVs) or EPA freshwater benchmarks are consistent with those identified in 1994 and 2006. Key COPCs include: metals (copper and zinc); PCBs (Aroclor 1254, Total PCB Aroclors, Total PCB congeners); pesticides (DDD, DDE, DDT, and dieldrin); and Total PAHs.

- **Sediment concentration patterns in 2017 sediment data are consistent with 1994 and 2006 and confirm widespread low-level contamination throughout the Slough.**

In general, the sediment contaminant distribution pattern in 2017 is consistent with the contaminant distribution patterns observed in 1994 and 2006. In all three sampling events, Whitaker Slough, Middle Slough, and Lower Slough have higher concentrations and Peninsula Drainage Canal, Buffalo Slough, and North Slough have lower concentrations.

- **Contaminant concentrations are generally lower in 2017 than in 2006 and 1994.**

Although the sediment contaminant distribution patterns and key COPCs are similar between the three sampling events, there is a consistent pattern of lower contaminant concentrations in 2017 than in 2006 and 1994.

- **2017 sediment results identify several areas with elevated concentrations of COPCs and several areas with consistently low concentrations of COPCs.**

Fish tissue and sediment data will be used to evaluate changes to sediment and fish tissue concentrations over time, prioritize City actions, and inform programmatic decisions and actions taken to satisfy the 2005 DEQ Columbia Slough Sediment Record of Decision and 2016 IGA between DEQ and the City.

### *3.3.3 2018-2019 Fish Advisory Activities*

Fish consumption was identified in the 2005 DEQ Columbia Slough Sediment ROD as the most significant source of human exposure to contaminants in the Columbia Slough. The Oregon Health Authority (OHA) issued a Fish Advisory regarding the consumption of fish from the Slough (1993 with updates in 2010 and 2019). The City provides education and outreach regarding the fish advisory under the IGA between the City of Portland and DEQ.

#### *3.3.3.1 Fish Advisory Outreach*

In 2018, the City initiated a project to identify communities that may catch and consume fish from the Slough to inform the City's education and outreach efforts, based on the 2015 slough-wide fish tissue data (summarized above) submitted to DEQ and OHA in 2017. Communities identified include refugee, immigrant, and houseless communities. The neighborhoods along the Slough have some of the highest percentages of recent immigrants in the state.

In response, BES initiated work with targeted communities through the City's Community Engagement Liaison (CEL) Program. The CELs program is a group of City of Portland-trained civic activists, fluent in English, who are available to assist with public involvement programs that require interpretation and facilitation services.

In 2018-2019, BES contracted with CELs from targeted refugee and immigrant communities [Cambodian, Vietnamese, Russian, Ukrainian, Pacific Islanders, Latino/Latinx, African (Liberians, Congolese, Ghanaians, Swahilis, Nigerians, Somalians), Burmese (Burmese, Karen)] to: provide education on reducing health risks from eating fish from the Slough; provide feedback to help develop outreach materials (e.g., fact sheets, maps) and an updated fish advisory sign; and provide feedback to the City on effective education practices and messages.



CELs conducting outreach at one of the community events.

The CELs provide valuable insights into vulnerable and underserved communities regarding the Slough and in developing new fish advisory educational materials. Several new outreach materials were developed from this feedback, including new dissectible fish puppets, fish and species lists with real pictures. The CELs identified that new refugees and immigrants are likely most at risk when they first arrive in the United States, because of lack of resources, and fish from the Slough can feed their families. As families are in the area longer, find jobs, and integrate into the Portland community they often begin buying fish or fishing in areas outside of the Slough and are more knowledgeable about the risk of eating fish from the Slough. All communities are interested in more information about increased risks to young children and women of child-bearing age.



Fabric dissectible puppet for teaching how to prepare fish to reduce pollutants.

Fish advisory outreach and education will continue with the CELs Program in 2019-2020. OHA released an updated Fish Advisory for the Slough on December 11, 2019. The City and OHA are both updating their fish advisory websites and the fish advisory fact sheets. The fact sheet will be translated into approximately 10 languages for use by the CELs and for posting on the City’s website at [www.portlandoregon.gov/bes/FishAdvisory](http://www.portlandoregon.gov/bes/FishAdvisory).

### 3.3.4 Fish Advisory Signs

In 2018-2019, the City performed a survey of historical fish advisory signs and locations along the Slough where anglers may be catching fish. The City identified approximately 75 locations for the installation of new updated fish advisory signs. The City worked with CELs from target refugee and immigrant communities to design the updated sign. The City installed approximately 30 signs in the Lower Slough in June 2019. Additional signs will be installed in the 2019-2020 fiscal year.



New fish advisory sign developed with input from the CELs and installed at a Slough fishing location.

### 3.4 Sediment Characterization and Remediation

In 2012, DEQ identified potential in-water cleanup areas for the Slough, based on the results of historic broad-based sediment sampling and data evaluation. In 2018-2019 and continuing into 2019-2020, the City is evaluating the results of the 2016 slough-wide sediment sampling effort and additional DEQ sediment data in areas of potential DEQ-led sediment cleanup actions to prioritize upland source identification and source control.

Pollutant sources in the Slough are complex and varied. Significant pollutant sources include heavy commercial/industrial land use, recycling, salvage and manufacturing, high-traffic roadways, and contaminated site cleanups. DEQ and the City are cooperatively identifying potential upland sources and pursuing upland source investigations and source control work under the IGA to improve sediment quality.



*This page intentionally blank.*

## 4 Citywide Upland Programmatic Source Control Activities

The City implements city-wide upland source control actions in accordance with of DEQ issued permits and through several city-wide programs including:

- National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit #101314 (hereinafter referred to as the MS4 permit) issued to the City and the Port of Portland (the co-permittees) by DEQ on January 31, 2011. The City's NPDES MS4 Permit expired January 30, 2016, and the Permit has been administratively extended until a new permit is issued. Under the extended permit, the City is continuing with regular Stormwater Management Plan (SWMP) implementation, monitoring plan implementation, and annual report preparation.
- Water Pollution Control Facility (WPCF) Permit #102830 (i.e., underground injection control [UIC] systems UIC permit) issued to the City by DEQ on May 19, 2015.
- NPDES permit for the Columbia Boulevard Wastewater Treatment Plant
- Total Maximum Daily Load (TMDL) Program
- Intergovernmental Agreement (IGA) between DEQ and the City for the Administration of NPDES 1200z, 1200-COLS and 1200-A General Permits for stormwater discharges from industrial activities (DEQ agreement number 30001293)

Activities conducted under these permits or programs directly or indirectly reduce pollutant discharges via the stormwater pathway to the Columbia Slough and contribute to improving sediment and fish tissue quality throughout the Slough. This section specifically provides an overview of the city-wide activities performed to fulfill the requirements of the City's MS4 permit, conducted in accordance with the co-permittees' *Stormwater Management Plans* (SWMPs) during fiscal year (FY) 2018–19 (July 1, 2018, through June 30, 2019) and the City's *TMDL Implementation Plan* (TIP).

Specific City activities completed to fulfill the requirements of the 2005 DEQ Columbia Slough Sediment ROD and the 2016 IGA between DEQ and the City are described in Section 3.

### 4.1 Municipal Separate Storm Sewer System (MS4) Discharge Permit

The City and its co-permittee, the Port of Portland, implement citywide stormwater management programs under the DEQ issued MS4 permit. The City's stormwater basins and outfalls discharging to Columbia Slough Watershed are managed in accordance with this permit.<sup>5</sup>

Under the MS4 permit, the City implements a DEQ-approved *Stormwater Management Plan* (SWMP) that describes best management practices (BMP) used to control potential pollutant discharges to the City's stormwater system. These BMPs include but are not limited to:

1. Operations and Maintenance (i.e., for streets, sewers, and City facilities)
2. Industrial/Commercial Controls
3. Illicit Discharges Controls

---

<sup>5</sup> DEQ issued the first Portland permit in 1995 and renewed it for a second term in 2004 (with modifications in 2005). DEQ issued the final third-term permit on January 31, 2011. The permit expired on January 30, 2016 and has been administratively extended by DEQ.

4. New Development Standards
5. Structural Controls
6. Natural Systems
7. Public Involvement

The City's MS4 Program works within BES and with other City bureaus to achieve permit goals and objectives. Under the MS4 permit, BES developed BMPs and programs to improve stormwater quality and to inform subsequent revisions to City Code that incorporate stormwater controls into City-wide development standards. Annual MS4 reports are submitted to DEQ and summarize MS4 Program activities. Annual reports from 1995 to the present are available online.<sup>6</sup>

The MS4 Program provides the primary structure of the City's stormwater source control activities in the Columbia Slough Watershed. The following descriptions describe specific accomplishments, under MS4 Programs, specific to the Columbia Slough Watershed.

#### *4.1.1 Operations and Maintenance*

The City manages a highly varied inventory of stormwater assets that includes drainage conveyances, green streets, and other structural and non-structural stormwater features. New features are constructed every year. The City maintains an asset inventory and maintenance database and continues to evaluate and implement improved maintenance practices to protect water quality.

##### *4.1.1.1 City Storm and Drainage System*

BES' Stormwater Operations and Maintenance (SWOM) group manages a highly varied inventory of public stormwater infrastructure assets that includes drainage conveyances, green streets, and other structural and nonstructural stormwater features. The BES Stormwater Operations and Maintenance (O&M) team evaluates maintenance needs of MS4 components and generates work orders to address those needs. The BES Stormwater O&M Manual provides guidance to City staff on important maintenance practices and schedules for the variety of infrastructure components.

In general, BES groups stormwater system components into two broad categories: conveyance assets and water quality assets. As with the sanitary sewer, BES uses an asset management approach to storm system maintenance that considers the likelihood and consequences of failure to determine priorities. Water quality assets generally need a more intense inspection and maintenance program to preserve water treatment functionality. As such, those assets are inspected more frequently and maintenance is prescribed based largely on inspection results, with the goal of keeping the assets functioning as designed. Specific to BES's Green Street Maintenance Program, inspections are conducted annually at a minimum, and maintenance is conducted by City contractors approximately 3 to 4 times per year. For all water quality facilities, urgent problems and needed repairs are remedied as soon as possible, and routine system maintenance is scheduled to optimize efficiency and facility function.

---

<sup>6</sup> <http://www.portlandoregon.gov/bes/37485>

#### 4.1.1.2 City Roadways

The City implements practices in and around rights-of-way (ROWs) to prevent and limit pollutant discharges to the MS4 outfall basins, including street sweeping, spill control, erosion control, material testing, and other BMPs related to the operation and maintenance (O&M) of city roadways. PBOT is the primary bureau responsible for maintaining the City's roads, sidewalks, and other transportation and maintenance facilities and infrastructure.

The City's street cleaning program removes dirt and debris from City streets to provide a healthy, safe, and attractive environment for Portland residents and visitors. Regular removal of leaves and debris by members of the public as well as City crews is necessary to prevent stormwater drains from clogging, which can result in street flooding. Street cleaning protects water quality and minimizes the burden on the sewer system from surface debris. The street sweeping program sweeps over 4,000 lane miles of curbed streets in the City each year, including residential streets and major arterial streets. Additional BMPs that the City uses for roadways include:

- Following the Oregon Department of Transportation (ODOT) Routine Road Maintenance Water Quality and Habitat Guide.
- Erosion control during all sediment-disturbing activities.
- Using low-disturbance sign installation methods to avoid or minimize digging.
- Using mild cleaners, with no solvents, to clean signs.
- Monitoring weather conditions during asphalt grinding to avoid runoff.
- Hand-applying asphalt where necessary to prevent these materials from entering the MS4.

#### 4.1.1.3 City Facilities

**Maintenance Facilities.** In addition to maintaining the City's roadways and transportation facilities, PBOT operates critical city maintenance facilities. The PBOT Environmental Coordinator evaluates and tracks maintenance procedures, pilot tests new products and techniques, evaluates work processes including spill response, and monitors developments in related fields. PBOT is also a participating bureau in the City's Salmon-Safe Certification. PBOT employs significant management practices and programs that are innovative and consistent with Salmon-Safe Standards.

**Parks Operations.** PP&R implements many BMPs that prevent or minimize the potential for pollutants in stormwater runoff from the City's diverse parks system including implementing an Integrated Pest Management program to manage pests that are harmful to the health, function, or aesthetic value of park landscapes in an efficient, effective, and environmentally responsible manner, while paying careful attention to public and employee safety. A few examples of the City's IPM activities include:

- 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 and prevent their spread.
- Release of natural biological control insects.

PP&R became the City's first bureau to achieve Salmon-Safe Certification in 2004. The certification was renewed in 2012 and again in 2018.

#### *4.1.1.4 Salmon Safe Certification*

The City of Portland was the first city in the world to achieve Salmon-Safe Certification for its work to improve water quality and restore salmon habitat. In 2016, Portland City Council formally adopted the findings of Salmon-Safe's assessment, which was the culmination of a years-long process. Portland's designation means that city operations have conditionally passed the organization's comprehensive science-based evaluation of land and water management practices. Salmon-Safe certification affects day-to-day City operations that potentially impact downstream water quality as well as the construction and maintenance of City-managed properties, including City-owned buildings and the City's fleet of vehicles and bureau maintenance yards. There are several participating bureaus that are specifically tasked with carrying out elements of the Salmon-Safe Certification: PP&R (certified since 2003), BES, PBOT, Water Bureau, PF&R, Office of Management and Finance, and Bureau of Planning and Sustainability. Facility managers are committing to additional actions to limit water pollution, conserve water use, and restore habitat over the next 5 years, at which time City operations will be inspected for Salmon-Safe recertification.

#### *4.1.2 Industrial Stormwater Management*

##### *4.1.2.1 Industrial Stormwater Permitting (NPDES 1200-Z Permits)*

The Industrial Stormwater Program administers General NPDES Industrial Stormwater Discharge Permits in Portland through an IGA with DEQ. Program staff conduct annual compliance inspections of permitted sites, provide technical assistance on BMP implementation, and issue enforcement referrals for instances of noncompliance. ISW also performs inspections of nonpermitted sites to assess the need for permit coverage, evaluates sites with No Exposure Certifications (NECs) to verify that the permit exemption is valid, and locates and maps private outfalls located throughout riparian areas that discharge directly to receiving streams and identifies the sources that drain to these outfalls.

Industries that exceed the geometric mean concentration for specific pollutant benchmark (e.g., copper, lead, zinc, *E. coli*) are required to install stormwater treatment (i.e., Tier II Corrective Action). Alternatively, industries that trigger Tier II can meet the requirements by infiltrating stormwater on-site; this approach is known as a Tier II Waiver. Tier II Treatment and Tier II Waivers are collectively referred to as Tier II Corrective Action.

In fiscal year 2019:

- The City managed 109 1200z permits for facilities located in the Columbia Slough.
- Four new facilities were required to obtain 1200-Z permit coverage.
- The City documented 110 permit violations that resulted in 26 facilities being referred to DEQ Office of Compliance and Enforcement.
- Two facilities triggered Tier II Corrective Action and will be required to install stormwater treatment or volume reduction measures. BES will inspect these facilities to verify that the Tier II improvements were completed.

#### *4.1.2.2 Columbia South Shore Well Field Wellhead Protection*

The City provides outreach and technical assistance to businesses and residents in the Columbia South Shore Well Field Wellhead Protection Area to help them comply with local drinking water source protection regulations, which are designed to prevent contamination of groundwater used as the drinking water source. Because much of the area is in the City's MS4 area, these activities are beneficial to protecting local surface water as well. Businesses in the area are required to implement structural and operational BMPs to manage harmful chemicals, reduce the occurrence of spills, and minimize spill impacts. Activities in 2018–19 included the following:

- Made over 2,100 individual outreach contacts.
- Provided technical assistance to 32 businesses.
- Provided a groundwater protection workshop, including spill control basics, attended by roughly 40 businesses.
- Distributed 23 free spill kits, 24 signs, and 1 secondary containment pallet.
- Maintained the Columbia Corridor Association and City of Portland webpages on the Groundwater Protection Program with information for businesses and residents.
- Conducted 118 site inspections for compliance with the City's *Wellhead Protection Area Reference Manual*.

#### *4.1.3 Illicit Discharge Detection and Elimination Activities*

##### *4.1.3.1 Spill Prevention*

The Industrial Stormwater Program (discussed in Section 4.1.2.1) ensures that BMPs relating to spill prevention and reporting are properly implemented at industrial facilities covered by a NPDES 1200z permit. During the reporting year, the program administered 109 permits in the Slough with requirements to maintain spill prevention and response procedures.

##### *4.1.3.2 Dry-Weather Field Screening*

BES inspects major outfalls during dry weather to identify and eliminate illicit or non-stormwater discharges of concern. During the 2018-19 fiscal year, 202 outfall inspections were performed citywide, and 73 outfalls were observed to have flow during dry weather.

##### *4.1.3.3 Pollution Complaint Response*

The City's Spill Protection and Citizen Response (SPCR) Program investigates pollution complaints that have the potential to impact the MS4 and enforces prohibited discharge violations of Portland City Code 17.39. SPCR operates a 24-hour spill response hotline and administers a duty officer program that responds to pollution complaints 365 days a year. During the 2018-19 permit year, SPCR received and responded to roughly 2,090 calls City-wide regarding pollution complaints, spills, sewer overflows, dye tests, and other pollution-related inquiries.

SPCR also facilitates coordination related to spill response and participates on the Regional Spill Response Committee. The Regional Spill Response Committee includes representatives from different City bureaus and the DEQ, the U.S. Coast Guard, Clackamas Water Environment Services, Port of Portland, and the City of Gresham, among others.

#### *4.1.3.4 Investigation and Enforcement*

The Illicit Discharge Detection and Elimination (IDDE) Program, the SPCR Program, and the ISW Program all inspect and investigate possible prohibited discharges to the MS4. If an inspection or an investigation determines that a prohibited discharge took place, and a responsible party can be determined, BES will pursue an enforcement action. During fiscal year 2018-19, 27 notice of violations were issued citywide to 19 responsible parties and a total of \$42,906 were collected from penalties and costs.

#### *4.1.4 New Development Standards*

##### *4.1.4.1 Erosion Control Activities*

The City's erosion control program applies to both public and private construction projects. Portland City Code Title 10 and the City's *Erosion and Sediment Control Manual* outlines requirements and provides technical guidance for temporary and permanent erosion prevention, sediment control, and control of other site development activities that can cause pollution during the construction process. The City's erosion control requirements apply to all ground-disturbing activities, regardless of whether a development permit is required, unless such activities are otherwise exempted by Portland City Code.

The Bureau of Development Services (BDS) administers and enforces erosion control requirements for private development sites. Sites with qualifying ground disturbance areas are inspected for temporary and permanent erosion control measures at the beginning and near or at completion of the project. Interim checks are conducted during regular building inspections or as needed for problem and complaint-related sites. City inspectors note deficiencies related to BMP implementation and require site operators to implement corrective action when needed.

The public works bureaus (Water, Environmental Services, Transportation, and Parks) manage erosion, sediment, and pollutant control activities and BMPs for their respective City infrastructure projects that involve public works permits. In general, public works projects are inspected daily during construction.

In June 2018, BDS promulgated new regulations (PCC 24.55.205), which address asbestos and lead discharges from demolition activity. Inspection and enforcement of this program is overseen by site development inspectors and linked directly by administrative rule to air quality erosion, sediment, and stormwater protection.

An Erosion, Sediment, and Pollutant Control Plan (ESPCP) is required by the City for ground-disturbing activity that exceeds 500 square feet and that require 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 environment zones, in greenway overlay zones, or in response to a violation of the City's erosion control requirements. The City has the authority to issue citations and other financial penalties for violation of the Erosion Control Code. During fiscal year 2018-19, 2,847 permits were issued citywide, 6,730 inspections were performed, and 2,058 enforcement actions and correction notifications issued.

##### *4.1.4.2 Stormwater Management Manual Developments*

The City's *Stormwater Management Manual* (SWMM) provides policy and design requirements for stormwater management throughout the City of Portland. The requirements in the manual apply to all development, redevelopment, and improvement projects within the City on private

and public property and in the public right-of-way. Projects with 500 square feet or more of impervious area trigger stormwater management requirements, including volume and flow control and water quality control using specified treatment and green infrastructure facilities.

The City is currently implementing the 2016 SWMM. Implementation reviewing development plans for public and private projects, providing technical assistance to developers early in the design process, inspecting the design and installation of stormwater management facilities (SMFs), and enforcing operations and maintenance requirements for SMFs in the long term.

As required by the SWMM, private development triggered the construction of approximately 123 new stormwater treatment facilities in the Columbia Slough Watershed in fiscal year 2019.

The SWMM will be updated in 2020.

#### *4.1.4.3 Stormwater Management Manual Implementation*

BES has several teams tasked with SWMM implementation that includes reviewing development plans for public and private projects, providing technical assistance to developers early in the design process, inspecting the design and installation of SMFs and enforcing O&M requirements for SMFs in the long term. Citywide in 2018-2019, SWMM implementation resulted in: 8,126 SWMM permit reviews; construction of over 1,500 stormwater management facilities, and 357 O&M agreements recorded.

BES' Maintenance Inspection Program (MIP) ensures that stormwater management facilities constructed on private property are operated and maintained in accordance with City requirements. The facilities, which include but are not limited to vegetated stormwater facilities and subsurface infiltration facilities, are built as part of new development standards under the City's Stormwater Management Manual. All sites are inspected at least once per five-year cycle for industrial, commercial, and multi-family properties. The MIP program confirms that new development and ongoing system management on private property is done in a way that reduces pollutant loads to the stormwater system and the Columbia Slough.

- 545 facilities at 184 properties were inspected in fiscal year 2019.
- 140 new facilities and 89 new properties were added in fiscal year 2019.

#### *4.1.4.4 Pollution Prevention and Source Control*

BES's Pollution Prevention Plan Review team conducts land use and pollution source control reviews associated with commercial and industrial properties subject to requirements in the City's *Source Control Manual* (SCM). In 2016, BES separated Chapter 4 out of the SWMM into the stand-alone SCM. The SCM specifies pollution control requirements for development and post-development activities that are considered high-risk or pollutant-generating. The manual identifies structural, operational, and treatment BMPs designed to prevent or control conventional and toxic pollutants in stormwater, groundwater, and wastewater.

Citywide in 2018-2019, SCM implementation resulted in: 320 contaminated site case reviews; and construction of over 1,700 pollution control measures.

The SCM will be updated in 2020.

#### 4.1.5 Structural Controls

##### 4.1.5.1 Stormwater System Plan

The BES *Stormwater System Plan* is a comprehensive asset management approach that identifies major infrastructure improvement needs for the City's storm system and natural drainage operations. Development of the *Stormwater System Plan* is a multi-year process that includes a risk assessment and review of stormwater system capacity, condition, service needs, water quality and stream impacts. Activities conducted over FY 2018–19 include the following:

- Continued refinement of stormwater service categories using the best available data including:
  - Water quality degradation
  - Habitat degradation
  - Stormwater system deficiencies that impede community development
  - In-stream erosion due to development activities
  - Landslide hazards
  - Localized nuisance flooding
- Integrated stormwater system planning tools and approaches into broader BES stormwater and watershed planning, monitoring, analysis, and decision-making.
- Initiated an Asset Inventory and Condition Assessment program to gather information and data to evaluate risk and opportunities associated with the existing stormwater system.

##### 4.1.5.2 Storm System Retrofits and Green Streets

The City continues to implement retrofit projects to roadways and the existing storm drainage system to address water quality and stream health. These retrofits include construction of stand-alone treatment facilities or the conversion of existing drainage infrastructure to facilities that promote watershed health and treatment and/or infiltration of runoff (e.g., roadside ditches to swales or porous shoulders).

BES projects that were in design or construction during FY 2018-2019 to provide stormwater treatment for City rights-of-way include outfall basins: 57, 58, 59, 60, 61, 61A, 62, 62A, 63, 64, 65, 73A, 100, and 104B. These retrofit projects are being completed in accordance with the Columbia Slough ROD and IGA and described in Section 3.

#### 4.1.6 Natural Systems

Trees, shrubs, and groundcover protect the Slough by preventing erosion, intercepting rainfall and reducing stormwater flow to the Slough. Trees along the riparian area help to shade the Slough and reduce water temperatures, while providing habitat to native birds and wildlife.

#### 4.1.6.1 Watershed Revegetation Program

Through partnerships with other government agencies, businesses, and private landowners, the BES Watershed Revegetation Program's fiscal year 2019 accomplishments included:

- 1,147 trees planted
- 1,575 shrubs planted
- 369.5 acres of habitat restoration sites managed
- 79,295 linear feet of revegetated stream bank managed

#### 4.1.6.2 Tree Program

BES partnered with Friends of Trees to plant trees above and beyond those planted through the City's Watershed Revegetation Program. Through a contract with Friends of Trees, BES planted 807 trees, most of which were planted over impervious surfaces, in the Columbia Slough Watershed in fiscal year 2019.

BES has multiple tree planting incentive programs designed to encourage private property owners to plant trees, as every tree planted in watershed contributes to a cleaner Slough. BES approached property owners throughout the Columbia Slough Watershed, offering free trees, tree planting, and three free years of free watering. BES also offers rebates or "Treebates" to private property owners that plant trees in residential yards. Through these, and other programs, an additional 130 trees were planted in the watershed in fiscal year 2019.

#### 4.1.7 Public Involvement (Education and Outreach)

##### 4.1.7.1 BES Clean Rivers Education Program

BES' *Clean Rivers Education* program offers free classroom and field science programs that focus on watershed health, water quality, stormwater, riparian plants, wildlife, and related environmental issues. During fiscal year 2019, BES offered programming in the Columbia Slough Watershed to:

- 32 schools/organizations
- 2,792 students
- 121 classroom and field programs



BES Watershed Revegetation staff performing vegetation survey at City-owned wetland.

#### 4.1.7.2 *BES Community Watershed Stewardship Program*

The Community Watershed Stewardship Program (CWSP) helps Portlanders make improvements in their neighborhoods and communities, while also improving the health of our watersheds. CWSP is a partnership between Environmental Services and Portland State University. The CWSP outreach strategy for 2018-19 was focused on equity by making the program more accessible to underrepresented communities and first-time applicants.

During fiscal year 2019, the CWSP provided \$20,000 in grants to projects within the Columbia Slough Watershed with over \$59,000 in matching funds obtained.

Below are brief descriptions of projects funded by CWSP in the Columbia Slough Watershed:

##### **Camp ELSO Wayfinder's Program**

Camp ELSO (Experience Life Science Outdoors) provides culturally-specific environmental programming to empower children of color to explore STEM and possible future career pathways. Through this project, Camp ELSO expanded their Wayfinder's Program and engaged over 80 youth in more than 40 hours of hands-on environmental education. Programming included field trips to sites such as the Children's Arboretum and Smith and Bybee Wetlands. Additionally, the project helped to pilot the Children's Learning and Heritage Garden in the New Columbia neighborhood where students are invited to learn about garden ecology.



##### **Neighbors Helping Neighbors PDX**



Neighbors Helping Neighbors PDX (NHNPDX) is a 100 percent volunteer-driven organization that provides free trash removal services to the houseless community in 11 north Portland neighborhoods twice a week since 2016. The goals of NHNPDX are to:

- 1) Reduce friction between neighbors
- 2) Improve neighborhood livability,
- 3) Provide a healthier and safer environment for those living without permanent shelter,
- 4) Reduce household trash in North Portland stormwater systems and watersheds, and
- 5) Encourage interaction and mutual respect between neighbors.

During the span of this project, NHNPDX contacted 451 unsheltered community members living in 395 encampments and collected more than 73,000 pounds of household trash reducing trash in our local stormwater systems and watersheds.

### *4.1.7.3 Columbia Slough Watershed Council*

BES contracts with the Columbia Slough Watershed Council (CSWC), a non-profit organization uniquely positioned to provide environmental education, community stewardship, and stream/wetland restoration in the Slough Watershed. CSWS provides a crucial link to citizen, students, and businesses throughout the watershed. The CSWC's staff is knowledgeable about Columbia Slough-related water and sediment quality, a variety of endangered species issues, watershed restoration efforts, and waterway and natural area recreational opportunities. The CSWC hosts numerous community events, including, Slough 101, Explorando el Columbia Slough, Columbia Slough Regatta, Aquifer Adventure, and numerous paddling tours.

During fiscal year 2019, the CSWC hosted 80 community events and had 5,076 community contacts.



2019 Columbia Slough Regatta

**CSWC Stewardship Saturdays.** BES' contract supports the CSWC's Stewardship Program. The Stewardship Program is dedicated to improving watershed health by combining local residents, natural areas, and restoration activities throughout the watershed. Volunteers plant native trees and shrubs, remove invasive vegetation, and remove trash while strengthening their connection to our local environment.

**CSWC Slough School.** Slough School is the main kindergarten through college educational program of the CSWC, created to provide hands-on programs for students to learn about the history and ecology of the watershed and its organisms as well as human impacts on the area. During fiscal year 2019, the CSWC engaged with:

- 6,864 student contacts participated in Slough School
- 28 school/organizations involved
- 448 teacher and chaperone contacts

During fiscal year 2019, the CSWC's Stewardship efforts included:

- 47 community stewardship events
- 11,061 native trees and shrubs planted
- 2,614 volunteer hours

## 4.2 Total Maximum Daily Loads

DEQ established total maximum daily loads (TMDLs) for local rivers, which specify the maximum amount of pollutants that various entities can contribute to the Willamette River, Columbia Slough, and tributaries that do not meet water quality standards.

The City updated the *TMDL Implementation Plan* (TIP) in 2019<sup>7</sup> to identify key management strategies and BMPs to reduce TMDL pollutants from nonpoint (i.e., diffuse) sources and improve water quality for the Willamette River and its tributaries including the Columbia Slough. Many of these strategies or BMPs are similar to those used to reduce the discharge of pollutants under the City's MS4 permit (see Section 4.1). The City will implement strategies identified in the 2019 TIP within its jurisdiction during the next 5-year implementation plan cycle (March 1, 2019, to March 1, 2024).

Many management strategies listed in the City's 2019 TIP are conducted to comply with the City's NPDES MS4 permit and associated SWMP. It is the City's intent to maintain consistency between the SWMP and the TIP, as most of these programs are applied citywide regardless of regulatory applicability.

The City submits annual reports which summarize the implementation status of the City's activities and management strategies to reduce TMDL pollutants in local waterbodies during each fiscal year. The City's *2018 TMDL 5-Year Evaluation Report* was submitted to DEQ in October 2018<sup>8</sup> and the City's *2019 TMDL Annual Report (No. 11)* was submitted in November 2019<sup>9</sup>



Lower Columbia Slough

---

<sup>7</sup> <https://www.portlandoregon.gov/bes/article/509613>

<sup>8</sup> <https://www.portlandoregon.gov/bes/article/702022>

<sup>9</sup> <https://www.portlandoregon.gov/bes/article/746034>

## 5 References

- BES. 2007. *Columbia Slough Watershed Long-Term Monitoring Plan*. City of Portland, Bureau of Environmental Services. August 2007.  
<https://www.portlandoregon.gov/bes/article/175915>
- BES and DEQ, 2011. *Columbia Slough Sediment Program Watershed Action Plan*. Prepared by City of Portland, Bureau of Environmental Services and Oregon Department of Environmental Quality.
- BES, 2016a. *2015 Source Tracing Investigation for Potential Contaminant Sources to Stormwater Outfall Basins Discharging to the Lower Columbia Slough* (BES, 2016c - pending) Prepared by the City of Portland Bureau of Environmental Services. Submitted to DEQ.
- BES, 2016b. *2015 Source Tracing Investigation for Potential Contaminant Sources to Stormwater Outfall Basins Discharging to the Whitaker Slough*. Prepared by the City of Portland Bureau of Environmental Services. Submitted to DEQ.
- BES, 2016c. *2015 Source Investigation for Potential Contaminant Sources to Stormwater Outfall Basins Discharging to the Marx-Whitaker Slough*. Prepared by the City of Portland Bureau of Environmental Services. Submitted to DEQ.
- BES, 2016d. *Sampling and Analysis Plan – Source Tracing and Stormwater Monitoring for Stormwater Outfall Basins Discharging to the Columbia Slough*. Prepared by the City of Portland Bureau of Environmental Services. Submitted to DEQ March 2016.
- BES. 2018. *Columbia Slough Data Management Framework, Version 3*. Prepared by the City of Portland Bureau of Environmental Services for Oregon Department of Environmental Quality. December 2018.
- BES and DEQ, 2016. *2016 Intergovernmental Agreement, Oversight of Columbia Slough Sediment Remedial Action*. City of Portland, by and through its Bureau of Environmental Services, and Oregon Department of Environmental Quality, Multnomah County, Oregon. Effective Date: January 1, 2016.
- BES and GSI. 2018. *Columbia Slough Fish Tissue Report - 2015 Sampling*. Prepared by the City of Portland Bureau of Environmental Services for Oregon Department of Environmental Quality. Submitted September 2017, Revised June 2018.
- BES and GSI. 2018. *Columbia Slough Sediment Data Analysis Report - 2017 Sampling*. Prepared by the City of Portland Bureau of Environmental Services for Oregon Department of Environmental Quality. Submitted June 2018.
- BES and GSI, 2018. *Technical Memorandum: Results of the City of Portland 2016-2018 Columbia Slough Stormwater and Stormwater Sediment Source Investigation Sampling Activities*. Submitted to DEQ June 21, 2018.

BES and GSI, 2019. *Source Tracing Investigation and Basin Characterization 2016-2017 and 2017-2019, Evaluation of Stormwater and Outfall Basins Discharging to the Columbia Slough*. Submitted to DEQ May 2019.

DEQ. 2005. *Record of Decision, Remedial Action Approach for Columbia Slough Sediment, Portland, Oregon*. Prepared by Oregon Department of Environmental Quality, Northwest Region Office. July 2005.

DEQ. 2010. *Guidance for Evaluating the Stormwater Pathway at Upland Sites*. Prepared by Oregon Department of Environmental Quality, Environmental Cleanup Program. January 2009 (updated October 2010).