CITY OF PORTLAND
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ▪ Dan Saltzman, Commissioner ▪ Dean Marriott, Director

September 1, 2011

Mr. Michael Pinney, PE
Oregon Department of Environmental Quality
NW Region Water Quality, Wastewater Division
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

Subject: Amended Stipulation and Final Order (ASFO) No. WQ-NWR-91-75
City of Portland Combined Sewer Overflow (CSO) Program
Annual CSO Progress Report for FY10-11

Dear Mr. Pinney:

Enclosed, please find two copies of the Annual CSO Progress Report submitted per the requirements of the ASFO Section 12.a (11). The Annual Progress Report describes the CSO Program activities performed during fiscal year 2010-2011 ending June 30, 2011. The report also includes a description of the work to be performed during the current fiscal year to complete the 20-year program by December 1, 2011.

If you have questions regarding this year's report, please do not hesitate to call me at (503) 823-7866.

Sincerely,

Virgil C. Adderley

Virgil C. Adderley
CSO Program Manager

Enclosures (Annual CSO Progress Report, FY 2010-11)

Cc: Dean Marriott, BES Director
Jan Betz, City Attorney
Jaime de la Garza, BES
Matthew Criblez, BES

CITY OF PORTLAND
COMBINED SEWER OVERFLOW PROGRAM

ANNUAL CSO PROGRESS REPORT TO DEQ

FISCAL YEAR 2010-2011

As Required by the Amended Stipulated Final Order
(ASFO WQ-NWR-91-75)

CITY OF PORTLAND
BUREAU OF ENVIRONMENTAL SERVICES

JUNE 30, 2011

Annual CSO Progress Report to DEQ for FY 2010-2011

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I. Summary

Portland's Combined Sewer Overflow (CSO) Program is less than a year from completing the 20-year program designed to control all CSO discharges by December 2011. As of June 2011, the City estimates it has reduced the average annual CSO volume since 1990 from 6.0 billion gallons to less than 2.0 billion gallons per year (67% reduction). During the summer and fall of 2011, many parallel efforts will be done to finish the work and complete the 20-year program.

During the past fiscal year (2010-11), the City continued the activities necessary to meet the final ASFO requirements for controlling the last 19 CSO outfalls by December 2011. This work is centered on the construction of the East Side CSO Tunnel System, the Sellwood CSO System, the Balch Consolidation Conduit, and the new facilities at the Columbia Boulevard Wastewater Treatment Plant which will treat the captured CSO. The City has completed tunneling for the East Side Tunnel and has begun connecting the outfalls to the completed tunnel.

This Annual CSO Progress Report, required under the Amended Stipulated and Final Order (ASFO), presents the activities completed during fiscal year that ends June 30. The highlights and note-worthy accomplishments from fiscal year 2011 include:

- **East Side CSO Tunnel**: The tunnel boring machine (TBM) completed the southern drive from the Opera Shaft to the McLoughlin Shaft. The TBM completed all of the 5.6 miles of tunneling as of October 2010.
- **Tunnel Shafts**: Final structural concrete lining work completed at all of the shafts, and by the end of the fiscal year (June) began connecting outfalls to the shafts so that CSO is now directed into the East Side Tunnel.
- Completed 12 **Sustainable Stormwater Program** green infrastructure facilities in the combined sewer area (only). These are designed to remove and infiltrate stormwater runoff from streets, parking lots, and roofs in the combined system.
- Since December 2006, thirteen overflow events have occurred from the West Side controlled outfalls – eleven during the winter season and two during the summer season. Five of the 13 events occurred during the 2010-2011 winter season which received unusually high rainfall.
- BES submitted the Post-2011 CSO Facilities Plan to DEQ on September 1, 2010 as specified in the ASFO.
- BES reported the 20-year progress to the EQC in a public forum in December 2010.
- BES submitted the Implementation of the Nine Minimum Controls, 2010 Update Report to DEQ in December.

The City of Portland has completed each of the 34 milestones required in the ASFO (see last page of Appendix A for full list) that have come due through June 30, 2011. One outstanding item (which is not a requirement) is a new Update to the CSO Facilities Plan Report. This report has been incorporated into the September 2010 Post-2011 CSO Facilities Plan required by the ASFO to describe how the City will continue to improve CSO control after December 2011.

Portland's CSO Program is on schedule and moving aggressively through the final stages of controlling the Willamette River CSO outfalls. The significant activities we expect to complete by December 1, 2011 include:

- Connecting the remaining East Side CSO outfalls to the Willamette Tunnel that are along the East Side alignment, from Outfall 28 at the southern end to Outfall 46 at the northern end.
- Complete construction on the Swan Island CSO Pump Station Phase 2 electrical and mechanical upgrades for 2011.
- Complete construction of the Portsmouth Force Main.
- Complete construction on the Balch Consolidation Conduit and shafts.
- Complete construction of the Sellwood CSO Storage & Pump Station system.
- Complete CSO Systems Operations Plan
- Complete the 2011 Total CSO System Startup

II. Introduction

Requirement for Annual Progress Report

This annual report to the Oregon Department of Environmental Quality (DEQ) is required under the Amended Stipulation and Final Order (ASFO) No. WQ-NWR-91-75 signed with the City of Portland (City) on August 11, 1994. During the period that the ASFO is in effect, the City is required to submit each year by September 1st an annual progress report summarizing the City's efforts to eliminate CSO discharges. The report is to contain information on CSO control activities performed during the past fiscal year and identify the CSO Program work planned for the current fiscal year. This report covers the CSO Program activities performed under the Capital Improvement Program (CIP) as well as the planning, operations, and maintenance activities performed by the Bureau of Environmental Services (BES) operating programs for the combined sewer and CSO systems during the past fiscal year.

Portland's Capital Improvement Program (CIP)

The City of Portland's Bureau of Environmental Services manages the planning, and implementation (pre-design, design, construction, & startup) of all capital projects. The CIP is divided into specific functional categories which include: CSO, Maintenance and Reliability, Sewage Treatment Systems, Surface Water Management, and Systems Development. The number of capital improvement projects, listed by program area, is shown in Table 1 below.

Table 1: Projects in Current Capital Improvement Program

Category	Projects Listed at End of FY 10-11	Projects Opened During FY 10-11
Combined Sewer Overflow	332	0
Maintenance and Reliability	789	51
Sewage Treatment Systems	551	37
Surface Water Management	406	68
Systems Development	355	21
Total	**2433**	**177**

At the end of fiscal year 2010-11, there were 2433 individual projects listed in the CIP and 177 projects opened during the year. For the CSO Program, there were 332 CSO projects listed in the CIP (see Appendix A for the CSO Capital Improvement Program Implementation Schedule). The 332 CSO projects represent the CSO Management Program, as it currently exists within the City of Portland in terms of CIP activities.

This report focuses primarily on the accomplishments of the CSO Program projects. It should be noted, however, that there are projects in other CIP categories that have or will have a positive impact on water quality and the control and/or handling of CSO such as basement flooding control projects and improvements at Columbia Boulevard Wastewater Treatment Plant (CBWTP). These other projects are not extensively covered in this report.

III. CSO Program Background

In 1991, when the Stipulation and Final Order (SFO) was issued by DEQ, approximately 60% of Portland's population was served by the combined sewer system. When a storm event occurred in the City that exceeded 0.10 inches in a few hours, stormwater runoff into the combined system would cause overflows to both the Columbia Slough and the Willamette River through up to 55 individual outfalls. Model simulations showed that the 1990 combined sewer system would discharge approximately 6.0 billion gallons of CSO to the Columbia Slough and Willamette River for an average rainfall year.

Since 1991, the City has implemented stormwater reduction facilities across the city (Cornerstone Projects), improved interceptor system performance, and completed large CSO conveyance, storage and treatment facilities in the Columbia Slough system. These activities have resulted in CSO discharges being reduced by two-thirds citywide. In the Columbia Slough,

CSO events have been eliminated for storms smaller than a 5-year winter or 10-year summer return frequency.

With the completion of the Westside CSO system and supporting projects in 2006 and the on-going work for the Expanded Downspout Disconnection Program, CSO discharge volumes to the Willamette River have been reduced (as of June 30, 2011) from 4.8 billion gallons per year (1990 estimate) to less than 2.0 billion gallons per year, based on average annual rainfall. This represents an annual system-wide reduction of nearly 67% since 1990.

The Amended Stipulated Final Order (ASFO) contains a firm schedule by which CSO controls must be implemented within a 20-year period from 1991 through 2011. The City has met or exceeded each of the regulatory requirements for CSO control identified in the ASFO. The ASFO contains the following major milestones for controlling the CSO outfalls:

- By December 1, 2000, the City must eliminate all CSO discharges to the Columbia Slough for storms equal to or less than the 5-year winter storm and 10-year summer intensities. [Milestone completed.]
- By December 1, 2001, the City must eliminate CSO discharges at 7 Willamette River outfalls for storms less than or equal to a 3-year summer storm and limit winter overflows to four or less per winter on average. [Milestone completed.]
- By December 1, 2006, the City must eliminate CSO discharges at 16 additional Willamette River CSO outfalls for storms less than or equal to a 3-year summer storm and limit winter overflows four or less per winter on average. [Milestone completed.]
- By December 1, 2011, the City must eliminate CSO discharges at all remaining Willamette River outfalls for storms less than or equal to a 3-year summer storm and limit winter overflows to less than four per winter on average. [Construction underway.]

The ASFO has a number of intermediate milestones, including submission of this annual CSO progress report to DEQ by September 1 of each year that the ASFO is in effect.

IV. Past Fiscal Year Activities

The CSO abatement activities performed during the period beginning July 1, 2010 and ending June 30, 2011 are categorized in five subsections:

- ASFO Milestones Achieved
- Program Planning Accomplished
- CSO Control Projects Planned, Designed, and/or Constructed
- CSO Operation and Maintenance Activities
- Public Involvement Activities

A. ASFO Milestones Achieved

This past fiscal year Portland completed four ASFO milestones identified for the 20-year CSO program. In total, there are 38 milestones beginning with the first CSO Progress Report required in 1995, and ending with the final report in 2012 that will demonstrate the completed system's compliance with the ASFO performance criteria. In fiscal year 2011, BES addressed the following ASFO milestones:

- Milestone #31 – Submit Annual CSO Progress Report - ASFO Section 12.a (11): "By no later than September 1 of each year that this Amended Order is in effect, the City shall submit to the Department and to the Commission for review an annual progress report on efforts to eliminate untreated CSO discharges, subject to the storm return frequencies specified in Paragraph 12.a. of this Amended Order."
- Milestone #32 & #33 – Submit Post-2011 CSO Facilities Plan - ASFO Section 23.d: "Respondent shall submit to DEQ no later than September 1, 2010, an approvable facilities plan report outlining the methods for achieving further reductions in the frequency and volumes of CSOs after the term of this Amended Order. Methods evaluated should include, but not be limited to, those listed in Section a. of this paragraph. This facilities plan shall be subject to approval by the Environmental Quality Commission". This report also effectively updated the optional CSO Facilities Plan that was drafted in 2006 (Optional Milestone #33) and incorporated into this report.
- Milestone #34 – 2010 Public Update to the Commission – ASFO Section 24: "The Respondent shall report to the Commission in a public forum its progress for CSO reductions as outlined in paragraph 23, above, at a time established by the Commission and the Respondent in the years 2001 and 2010".

B. Accomplishments in Program Planning

The CSO Program continues to execute planning projects for facilities and activities that will cost-effectively reduce CSO and assure that the Program meets our regulatory obligations. Planning activities performed during Fiscal Year 10-11 include the following:

Post-2011 CSO Facilities Plan

The ASFO requires the City of Portland to submit a Post-2011 CSO Facilities Plan that outlines methods for further CSO reductions beyond the 4-per-winter and 3-year summer storm level required for the Willamette CSO outfalls. Further reductions will be observed by the reduction of the number of winter CSO events, from an average of four per winter to about two per winter. These further reductions will be achieved immediately in December 2011 and will be sustained by implementing green infrastructure under existing BES programs and using an adaptive management approach. Portland submitted the final version to DEQ on September 1. The report was reviewed and approved in 2011 by the EQC.

Also as required by the ASFO, Portland presented an updated progress report on the status of the 20-year CSO Program publicly to the EQC at the December 2010 EQC meeting.

2011 CSO System Operating Plan

Portland is developing the detailed operations manual by which the combined sewer system, the CSO system, and the CBWTP treatment systems will be controlled to meet NPDES permit requirements and several operating objectives. This report, along with the similar CBWTP Wet Weather Operations Manual, will be submitted to DEQ as required by the new NPDES permit by December 31, 2011.

Portland's Facilities/System Planning

The Asset Systems Management Division in the Engineering Services Group, which is responsible for Facilities Planning, initiated in 2005 the update to the Combined Sewer System Plan (CSSP), Sanitary Sewer System Plan (SSSP), and the Pipe Rehab Plan. BES is completing this effort to produce detailed Public Facilities Plans that are integrated with the Portland Watershed Plan and incorporate asset management techniques. The CSSP incorporates pipe upgrades along with green infrastructure stormwater controls to reduce basement backup risk and CSO discharges in the future. Both the Combined System Plan and the Sanitary System Plan are scheduled to be completed in the fall of 2011. The Stormwater System Plan, focused on the separated (non-combined) areas, began in 2009 and will require multiple years to complete.

C. Accomplishments in Predesign, Design and Construction

As noted in Section II, 332 projects that are active in the City's CIP are directly related to the CSO Program. To be "active" a project must have been in at least one of the following project phases:

- Predesign
- Design
- Advertise/Bid
- Construction
- Startup / Close Out

Appendix A provides a graphical status check for the 332 CSO projects. The major active projects are described in narrative summaries below. The small number of active projects reflects the maturity of the CSO Program as it nears the end of the program.

Downspout Disconnection FY 10/11

During FY 10/11, the City finished the Downspout Disconnection Program, which had been active for 17 years in all Eastside Combined Sewer basins. The Program was active in all eastside combined sewer areas, including those originally recommended by the 1994 CSO Facilities Plan (where sumps were installed).

Downspouts were disconnected at 516 properties. Of these properties, 283 were located in the original Cornerstone Project area defined in the 1994 CSO Plan and 233 were in the expanded Program area. This is estimated to remove about 12 million additional gallons of stormwater per year from the combined sewer system.

As of June 30, 2011, there were 26,529 properties representing 54,509 disconnected downspouts that have been approved through the Downspout Disconnection Program, removing about 611 million gallons of stormwater per year from the combined sewer system. In addition, more than 35,000 surveyed homes have been found to have one or more downspouts already disconnected or having other onsite stormwater management, resulting in an estimated 1.6 billion gallons of stormwater removed from the system annually.

The Downspout Disconnection Program is now officially completed and no longer active.

Sustainable Stormwater Management Program (SSMP)

BES has organized several parallel efforts to reduce stormwater entering the combined system by implementing green solutions and stormwater controls into a single integrated program titled the Sustainable Stormwater Management Program (SSMP). There are three primary program areas:

(1) Pilot / Field Projects
(2) Policy and Technical Assistance
(3) Education and Outreach related to sustainable stormwater strategies.

Staff has also developed a monitoring program which includes documenting how projects contribute to CSO reduction goals.

The Sustainable Stormwater Program includes three CIP projects described in previous CSO annual reports: the Eastside Inflow Controls Predesign Project (completed spring 2007); and the Holladay, Stark, and Sullivan Inflow Controls Project. The program also includes the Innovative Wet Weather Program, which began implementation in FY05 and is funded by the City's operating budgeted and EPA grant funds.

Innovative Wet Weather Program (IWWP)

The IWWP is funded through an EPA grant for innovative projects that demonstrate sustainable, low-impact stormwater management solutions. Funds have been earmarked for projects in three categories: Water-quality Friendly Streets & Parking Lots, Downspout Disconnections, Bioswales and Ecoroofs. Completed projects funded by IWWP in FY10-11 were all in the separated sewer system.

Holladay, Stark, and Sullivan Inflow Controls Projects

In 2002 BES completed an engineering predesign analysis to address capacity problems in the combined sewer serving the Holladay, Stark, and Sullivan basins. The predesign recommended a number of local stormwater management projects to protect residents from sewer backups.

In 2003 BES completed the first project, diverting runoff from 0.8 acres of paved surface into a landscape infiltration basin near Glencoe School. The project protects residents on

SE 52nd from sewer backups and preserves capacity in the East Side CSO Tunnel. The second project, completed in 2007, protects residents on SE Pine Street by managing runoff from more than two acres of asphalt and roofs at Tabor Middle School. The project included infiltration planters and swales at the school as well as a vegetated stormwater curb extension and sump to manage street runoff.

Three projects areas will begin construction in August 2011. The projects will protect residents from sewer backups in the vicinity of Laurelhurst School, NE 45th and Davis, and SE 56th and Ankeny. They include twenty-six green streets facilities, two private stormwater retrofits, and 756 LF of pipe replacement. Construction of the right-of-way elements will occur first, to be followed by construction of the private retrofits in 2012.

1% for Green (1%) Projects

The City of Portland collects one percent of the construction budget of projects in the public right-of-way that are not subject to the requirements of Portland's Stormwater Management Manual and puts the money in Portland's 1% for Green fund. The fund supports construction of green street facilities in the City of Portland that manage stormwater, enhance livability, and provide other environmental benefits.

Six new green street facilities were installed in the combined sewer area, managing a total of 64,000 square feet of street.

Location	Description	Drainage Area (sf)
NW Pettygrove & 26th	One large curb extension	18,000
SE Lambert & 17th	Three curb extensions	12,000
SE 28th (south of Steele)	Street-side swales	18,000
SW Barbur & Sheridan	One large curb extension	16,000

Grey to Green Initiative (G2G) Projects

Grey to Green is an acceleration of Environmental Services work to add green infrastructure. The bureau will invest $50 million over five years (FY09 – FY13) in ecoroofs and green street facilities, street and yard trees, removing invasive vegetation and restoring native plants, and acquiring and protecting sensitive natural areas.

Six green street facilities were completed with Grey to Green funds in the combined sewer system:

Location	Description	Drainage Area (sf)
NE Going & 33rd	Two curb extensions	7,000
SE Center-Gladstone	Three curb extensions	24,400

SE Glisan & 28th	One curb extension	7,200

Ecoroof incentives provided by Grey to Green, helped the city gain an additional 2 acres of ecoroofs in the combined sewer area.

Community Benefit Opportunity (CBO) Projects

Under this program, BES completed a community mural in the Buckman neighborhood, began installing a community garden in the Lloyd/Eliot neighborhood, and planted over a hundred of street trees in 14 different neighborhoods along the whole East Side CSO Tunnel alignment. The street trees planted this past fiscal year is in addition to the several hundreds planted in the previous years.

Willamette River CSO Program Projects

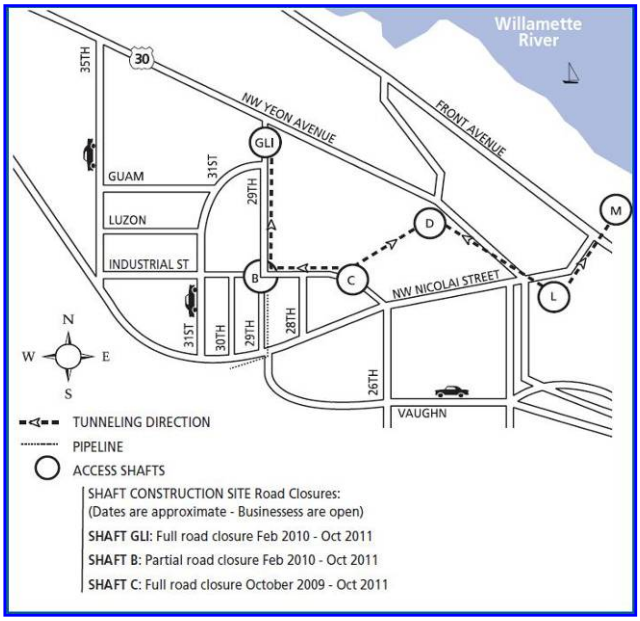
The Willamette River CSO Program has been designed to control the original 42 CSO outfalls that previously discharged to the Willamette River. The first two phases of this program have been completed with seven outfalls controlled in 2001, followed by 16 outfalls controlled in 2006. The remaining 19 outfalls will be controlled by the East Side CSO Tunnel as well as smaller projects outside the alignment of the tunnel.

Balch Consolidation Conduit

The Balch Consolidation Conduit (BCC) is an 84-inch diameter, 7000-foot long pipe that will capture CSO discharges to Outfall 17 and convey the flow to the West Side CSO tunnel via the Nicolai drop shaft structure. The upstream end of the BCC is in the heart of the Balch CSO basin near the intersection of NW 29th Avenue and NW 29th Avenue. This location allows the BCC to provide local basement flooding relief and collect CSO from the basin.

Construction began in June 2009 with a projected completion scheduled for September 2011. The alignment for the shafts and 84-inch micro-tunnel is shown in the figure to the right.

During FY2010-11, the contractor (JW Fowler) completed all segments between Shaft GLI to Shaft D, and between Shaft M and L. The contractor will be completing the last segment after June 30, 2011 as well as constructing the 54-inch tunnel from



Shaft B to NW Nicolai that will collect wet weather flows from the local area.

CBWWTF Wet Weather Headworks (Wet Weather Screenhouse)

The Wet Weather Headworks on the CBWTP–CBWWTF site were completed during the FY2010-11 period and is now currently in use. Portland rehabilitated the old CBWTP screenhouse to create a 150 MGD Wet Weather Headworks. This new facility provides fine screening (1/4-inch openings) for 150 MGD of captured CSO flows.

East Side Willamette CSO Program

East Side CSO Tunnel Project

The East Side CSO (ESCSO) Tunnel will control CSO discharges at 13 outfalls to the Willamette River by December 2011. (Previously there were 14 outfalls on the list, but Outfall 31 was sealed off during a local maintenance project.) The tunnel is 5.6 miles long, 22 feet in diameter, and 85 to 165 feet deep. Actual tunneling was completed in October 2010, and the 13 outfalls will be connected to the completed tunnel during the summer period of June – August, 2011. Once the total system is completed in 2011, the tunnel will allow discharges from only four of the 13 outfalls during large storm events. The four active outfalls will meet or exceed the ASFO performance standard for controlling CSO to the 3-year summer storm and the 4-per-winter storm.

The contractor, Kiewit/Bilfinger Berger JV (KBB), continued work in all areas of the project this reporting year. Below is a list of the major work accomplished for the reporting period that ended June 30, 2011.

Tunnel: The tunnel boring machine (TBM) completed the southern drive from the Opera Shaft to begin the southern drive to the McLoughlin shaft in October 2010. By the end of the fiscal year, the TBM had passed through the Taggart Shaft and was approximately at SE Center Street along the McLoughlin alignment. The contractor completed 4,670 feet of tunneling during the reporting period (July 1, 2010 – June 30, 2011). 29,570 feet of tunneling in total has been completed for the East Side Tunnel.

Tunnel Shafts: Final structural lining work was completed at the last remaining shafts.

Pipelines and Outfalls: Opening the overflow pipelines from the outfalls to the tunnel is one of the final phases of the East Side CSO Project. This work will direct the combined sewer flows to the tunnel, and will be completed early June through August 2011.

Outfall 28 (SE 18th and Insley): Once diverted to the tunnel, the outfall will be sealed off so that all overflow goes to the East Side Tunnel via the McLoughlin Shaft.

Outfall 30 (Taggart at Ross Island Sand & Gravel): The Taggart Shaft and Overflow Structure will be monitored for any overflows discharging to Outfall 30.

Outfalls 33, 34 and 35 (SE 2nd and Clay to Morrison in the Central Eastside Industrial District): Once diverted to the tunnel, these outfalls will be sealed off so that all overflow goes to the East Side Tunnel via the Alder Shaft.

Outfall 36 (SE MLK and Alder): Connected to the tunnel via the Alder Shaft and Overflow Structure which will be monitored for any overflows discharging to Outfall 36.

Outfall 37 (SE Stark): Once diverted to the tunnel, this outfall will be sealed off so that all overflow goes to the East Side Tunnel via the Alder Shaft.

Outfall 38 (SE Oak): Once diverted to the tunnel, this outfall will be sealed off so that all overflow goes to the East Side Tunnel via the Alder Shaft.

Outfall 40 (Sullivan): Once diverted to the tunnel, this outfall will be sealed off so that all overflow goes to the East Side Tunnel via the Steel Bridge Shaft.

Outfall 41 (Holladay/Lloyd): Once diverted to the tunnel, this outfall will be sealed off so that all overflow goes to the East Side Tunnel via the Steel Bridge Shaft.

Outfall 43: (NE Wheeler): Connected to the tunnel via the River Street Shaft and Overflow Structure which will be monitored for any overflows discharging to Outfall 43.

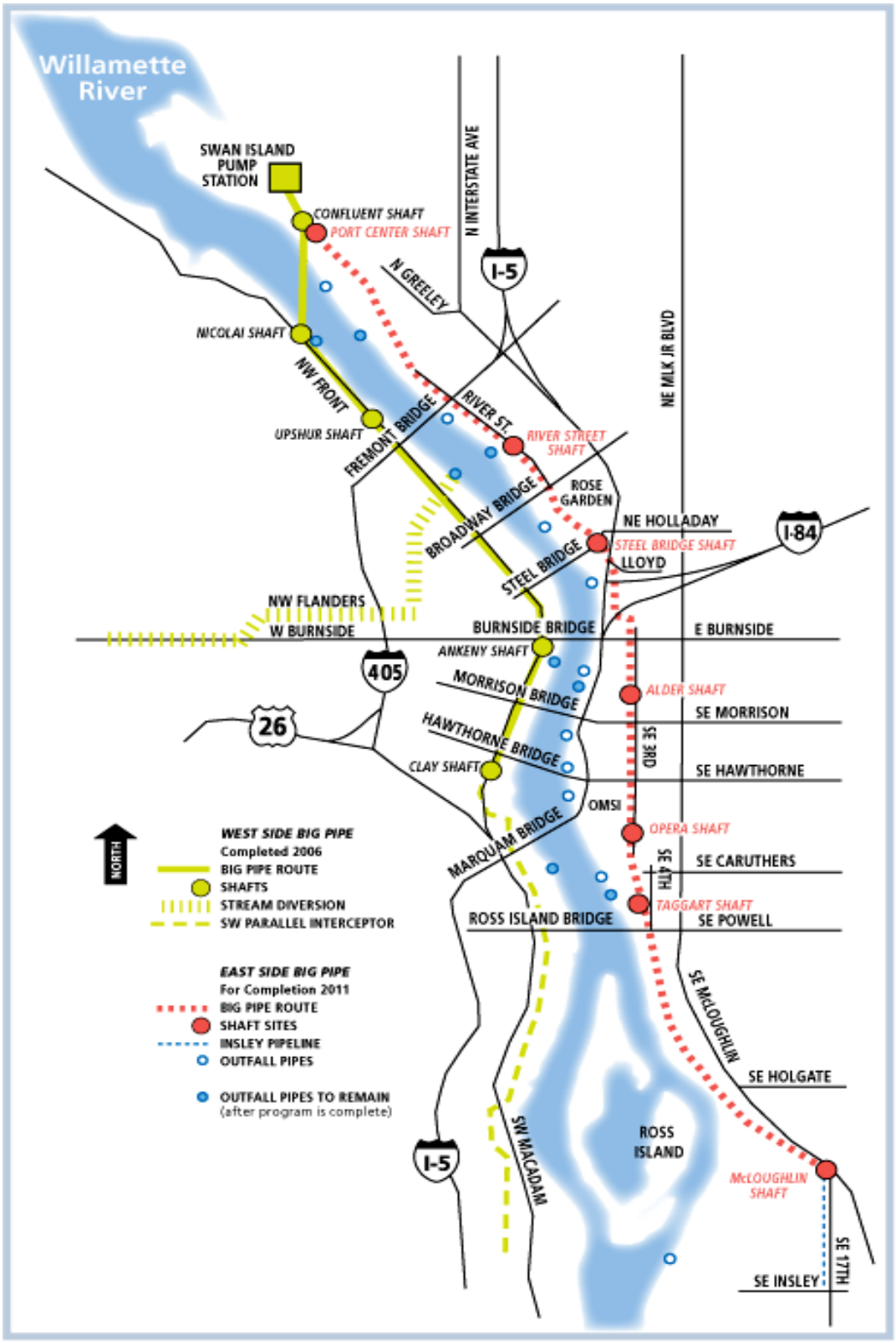
Outfall 44A(Essex/N. Randolph): Once diverted to the tunnel, this outfall will be sealed off so that all overflow goes to the East Side Tunnel via the River Street Shaft.

Outfall 46 (Beech/Greeley Rail Yard): Connected to the tunnel via the Port Center Consolidation Conduit and Shaft. The OF46 Overflow Structure will be monitored for any overflows discharging to Outfall 46.

Swan Island CSO Pump Station: Located on Swan Island at the downstream end of the tunnel is a 220 Million Gallon per Day (MGD) dry-pit submersible pump station that transfers flow from the tunnel through a new force main system to the existing interceptors - Peninsular Tunnel and Portsmouth Tunnel. The pump station is designed to accommodate low-flow dry-weather conditions as well as peak wet weather flows up to the design capacity. The pump station design includes surge control equipment and other site improvements.

The structural components of the pump station are all complete including the surface structures, dual-power stations, and Operations & Maintenance Building. The first phase of the pump station – a 100 MGD system – was completed in 2006 and has been in full operation since.

The Phase II portion of the pump station provides another 120 MGD of firm pumping capacity. The new pumps will discharge to the Portsmouth Force main and will become the primary wet weather pumping system.

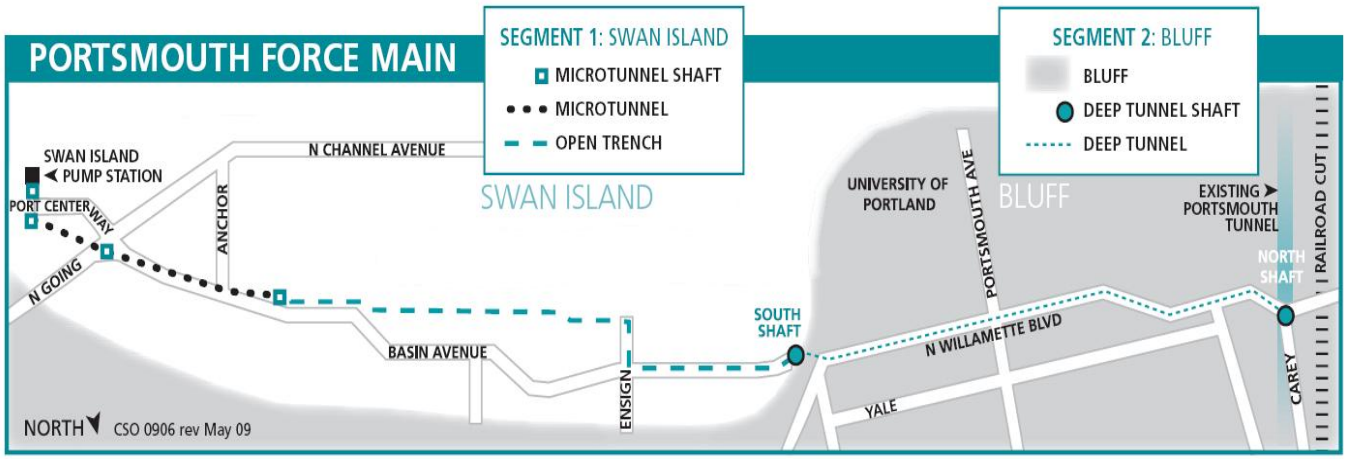


Map of Willamette CSO Tunnel System Route and Drop Shafts

Portsmouth Force Main: The Portsmouth Force Main connects the Swan Island Pump Station to the Portsmouth Tunnel interceptor and directs CSO to CBWTP for treatment. The 66-inch, 13,000-foot long force main will convey 120 MGD of CSO flow and will be complete in 2011.

During fiscal year 2010-11, the project team completed:

- Tunneling of both segments
- Installing of liners currently underway.
- For Portsmouth Force Main Segment 2 project, two tunnel shafts were constructed and approximately 250 feet of tunnel was installed.



Sellwood / Lents CSO Projects

The Sellwood and Lents CSO outfalls (OF26 and OF27) are south of the furthest reach of the East Side CSO Tunnel and will not directly benefit from the East Side Tunnel. Therefore, local solutions are being implemented in the Sellwood and Lents Basins to control CSO to the required ASFO level. The final project in this area to control CSO by December 2011 is the Sellwood CSO Pump Station / Lents Trunk Storage System:

Sellwood CSO Pump Station / Lents Trunk Storage System

BES developed a cost-effective way to control CSO discharges to Outfall 27 in the Sellwood area by converting the 90 year-old 72-inch tall by 56-inch wide Lents Trunk Sewer into an inline storage facility and designed the Sellwood CSO Pump Station to dewater it. This project replaces more expensive wet weather upgrades at Umatilla and Harney Pump Stations and eliminates the need to construct a large inline storage tank further upstream in the Lents basin. The project includes lining part of the 4,400 feet of the Lents Trunk, installing a CSO pump station and control weir, and installing bars screens for potential floatables control.

At the end of the fiscal year FY10-11, the project was under construction and had completed much of the super structure and support system. The updated schedule shows the full system will be ready and online by December 1, 2011.

Columbia Slough CSO Program

Since the completion of the Columbia Slough CSO facilities, the primary work performed on the facilities has consisted of operation, maintenance and monitoring. The large Columbia Slough Consolidation Conduit (CSCC) and the related pumping and conveyance system have performed well. Other than the December 28, 2005 accidental overflow previously reported to DEQ, there has not been an overflow from the CSCC system since it began operation in October 2000.

D. CSO Operation and Maintenance Activities Completed

During the year the City continued implementation of operation and maintenance practices that reduce the impact of CSOs and stormwater on the receiving streams. These activities capture and remove pollutants, floatables and debris from the stormwater before it is discharged to the receiving streams from the CSO outfalls. The following information provides the magnitude of the **citywide** effort, and the actual measurements available for this report.

- **Street, sump & stormwater related cleaning**
  - Inlets Cleaned: 12,351 units
  - Drainage Sumps Cleaned: 995 units

- **Sewer cleaning**
  - Combination Sewers 44 miles
  - Sanitary Only Sewers 158 miles
  - Total 202 miles

- **CCTV Inspection**
  - Combination Sewers 81 miles
  - Sanitary Only Sewers 184 miles
  - Total 265 miles

- **Root Treatment**
  - Combination Sewers 45 miles
  - Sanitary Only Sewers 6 miles
  - Total 51 miles

Diversion Structure Inspections and Modifications

The Diversion Structure Inspection Program is designed such that each active diversion structure that can overflow to a receiving water body (approximately 60) is inspected once a week. Diversions that overflow to a downstream facility (approximately 60) and do not pose a risk of

direct discharge to the receiving water body are inspected once every two months. Overall, the City performed approximately 3,475 diversion inspections last fiscal year.

E. Public Involvement, Education and Outreach Activities:

The focus of CSO public involvement, education and outreach in FY 2010-2011 was on construction of East Side CSO projects, and design and construction of the Balch Consolidation Conduit, Sellwood sewer projects, and Oak Basin sewer improvements. The goals listed below are met through the public information and involvement activities:

Goal 1: Inform and involve businesses and residents

Goal 2: Maintain good working relationships and two-way communication with the businesses and residents along the project alignment

Goal 3: Quickly respond to individual citizen or business concerns

Goal 4: Meet project milestones and deadlines

Goal 5: Help project stay on time and within budget

Outreach activities for CSO projects provide the latest project information to the public, and include working with businesses along tunnel and pipeline routes to minimize construction disruptions. Outreach provides businesses, residents, and business and neighborhood groups with project information and opportunities to give input on project decisions, including construction mitigation measures and traffic plans. These activities are tailored to the needs of area communities and are designed to reduce construction impacts. Door-to-door site visits were an invaluable tool to develop the long-term relationships during CSO construction. In addition to involving impacted communities in CSO project decisions, the bureau is committed to educating the public about environmental issues.

Environmental Services has implemented a public involvement plan for the East Side CSO projects. The projects include:

- The East Side CSO Tunnel (East Side Big Pipe)
- Construction of seven tunnel shafts
- SE 3rd Avenue sewer and outfall structure construction
- SE 2nd Avenue sewer and outfall structure construction
- SE 18th Avenue sewer and outfall structure construction
- N River Street utility relocation, and sewer and outfall structure construction
- Portsmouth Force Main

Community Benefit Opportunity Program

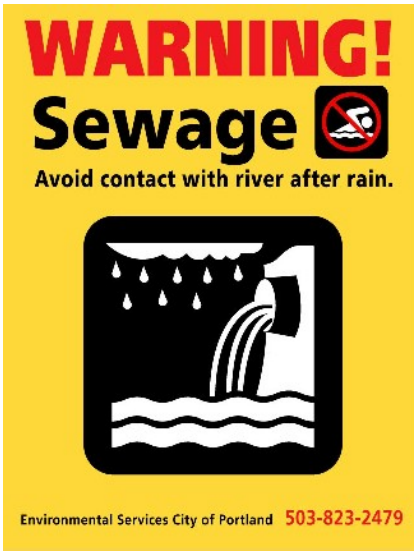
This program was created to add amenities to neighborhoods affected by CSO construction. East Side CSO construction affects 11 neighborhoods between SE 17th and McLoughlin and the

Columbia Boulevard Wastewater Treatment Plant. Community groups and citizens in those areas nominated projects in 2007. A citizen advisory committee reviewed the proposals and worked with Environmental Services to recommend 21 projects for funding, for a total of $1.77 million. The funded projects include bank restoration along the Willamette River, street tree planting, sustainable stormwater management facilities, trail access, and community gardens. Six of the 21 projects have been completed and several more are near completion. The remainder of the $2 million dollar budget was set aside for projects that may arise throughout the life of the East Side CSO Projects. Environmental Services awarded $192,000 to the Swan Island Transportation Management Association, an area heavily affected by construction of several CSO projects, to help complete the lower trail portion of the Waud Bluff Trail.

CSO Notification

The Environmental Services River Alert system notifies the public when CSO events occur.

The River Alert system also includes ten permanent, folding signs installed at public access points to the Willamette River. A contractor travels the river by boat and opens the warning signs each time there is a CSO between May 15 and October 15. Forty-eight hours after each CSO event ends, the contractor closes the warning signs. The contractor is required to supply BES with written reports that verify that the signs were opened or closed and when the work was completed. In Fiscal Year 2010-11 during the rainy season between October 15 and May 15, the signs remained open with the warning message in view for boaters and other river users. The Willamette River warning signs display the phone number of the River Alert Hotline, a 24-hour recorded message the public can call to learn if a CSO advisory is in effect and to hear a message about the CSO program.



Willamette River
CSO warning sign

Columbia Slough
extreme rain event warning sign

The River Alert program notifies the media by email every time there is an overflow to the Willamette River between May 15 and October 15. The Oregonian newspaper publishes a CSO advisory at the top of the weather page when overflows occur. In addition, Internet users can go to www.portlandonline.com/bes/overflow to learn if a CSO advisory is in effect. Internet users can also subscribe to automatic email notification each time Environmental Services issues a CSO advisory.

Clean River Projects Construction Signs

Environmental Services requires contractors to post signage at sewer construction sites to inform the public that the construction is a sewer project designed to keep rivers and streams clean. In addition, BES posts large banners at East Side CSO, and Portsmouth Force Main project construction sites.

CSO Interpretive Signs

Environmental Services interpretive signs are posted at CSO construction sites and along the Eastbank Esplanade. Modified interpretive signs are at two locations along the Portsmouth Force Main alignment. The signs have updated information about CSO tunnel construction.

Interpretive Sign

Media Relations

Environmental Services issues media advisories, news releases, traffic advisories, and media events to publicize CSO projects. Environmental Services also briefs reporters individually. The city provides timely, accurate responses to all media requests and keeps files of all newsprint and broadcast media coverage.

In fiscal year 2010-2011, Environmental Services issued the following 24 media releases related to CSO projects:

- 19 CSO advisories during the summer notification period
- 5 news releases about the CSO construction program

Media Events

- On August 28, 2010, Environmental Services held special East Side CSO tunnel tours for members of the public. Readers of a citywide newsletter about Environmental Services projects submitted their names and were selected to take the tours. An Oregonian reporter also attended and wrote about the event.
- On November 9, 2010, Environmental Services held the final public tour of the East Side CSO Tunnel for stakeholders and members of the media.

Internet

Environmental Services provides current information about the city's CSO programs at its CSO website, www.cleanriverworks.com. The site is dedicated entirely to CSO construction projects, schedules, and impacts. The Bureau of Environmental Services website is www.portlandonline.com/bes. River Alert information is posted at www.portlandonline.com/bes/overflow.

V. Planned Efforts for Current Fiscal Year

Fiscal Year 2010-2011 activities will bring the 20-year program to plan, design, construct, and operate Portland's CSO control system to near completion. The activities during this fiscal year can be briefly summarized as follows:

- Complete tunneling north to the Port Center Shaft. Remove machine and re-set into the Opera Mining Shaft and tunnel south to McLoughlin (Insley) Shaft.
- Continue completing the construction of shafts for the East Side Willamette CSO Tunnel System. Shafts cannot be fully completed until the tunnel has passed through the shafts, and then the final stages of the shaft can be constructed.
- Update the CSO System Operating Plan as the City continues operating, maintaining and monitoring the West Side Willamette and the Columbia Slough CSO Systems to assure compliance with the ASFO and the NPDES Permit

- Continue implementation of stormwater inflow reduction projects in the form of the Expanded Downspout Disconnection Program and the Sustainable Stormwater Management Program.

The current work is divided into the same subsections used for the previous year's efforts.

A. ASFO Milestones to be Achieved

In fiscal year 2011-12, BES will address two ASFO milestones, including the major one to control all the remaining CSO outfalls:

- Submit Annual CSO Progress Report - ASFO Section 12.a (11): "By no later than September 1 of each year that this Amended Order is in effect, the City shall submit to the Department and to the Commission for review an annual progress report on efforts to eliminate untreated CSO discharges, subject to the storm return frequencies specified in Paragraph 12.a. of this Amended Order."
- Control all remaining CSO outfalls on the Willamette River - ASFO Section 12.a (10): "By no later than December 1, 2011, the Respondent shall eliminate untreated CSO discharges, subject to the storm return frequencies specified in Paragraph 12.a. of this Amended Order, at all remaining CSO discharge points, consistent with the facilities plan approved by the Commission"

B. Program Planning to be Accomplished

CSO program-level planning will continue during the current fiscal year as the City develops two planning documents for CSO system:

- CSO System Operating – Update in 2011

In addition, the new Systems Planning effort will complete the process of examining the capacity and rehabilitation needs in the combined and sanitary systems. The end result will be a public facilities plan with recommended projects to address basement backups, SSOs and potential structural condition problems. BES expects to complete the combined and sanitary system plans near the end of calendar year 2011.

C. CSO Projects to be Predesigned, Designed and/or Constructed

The CSO control projects that will be in the predesign, design and/or construction phases during the current fiscal year include:

- **Sustainable Stormwater Management Program**: Approximately four to six new green streets are anticipated for construction in the combined sewer system in FY 11-12, funded by 1% for Green. The Ecoroof Incentive program under Grey to Green will continue to fund

ecoroof construction, and many are likely to be in the combined sewer area. Grey to Green green street funds will implement facilities mostly in the separated sewer area in FY12.

- **Balch Consolidation Conduit (BCC):** The BCC construction will be completed in September 2011 and placed online at that time.

- **East Side CSO Tunnel Projects**
  - **Community Benefit Opportunity Program:** In FY 11/12, BES will implement the Harvard/Olin/Willamette Triangle project currently under design, begin installation of the Waud Bluff Trail on Swan Island, and complete the Lloyd/Eliot Community Garden.
  - **East Side Tunnel:** Complete the work to connect the East Side outfalls to the tunnel shafts, and complete the site restoration work at all the shafts and surface connections.

- **Swan Island CSO Pump Station:**

  Complete the final installation and testing of the mechanical and electrical systems necessary to increase the firm capacity of the pump station from 100 MGD to 220 MGD.

- **Portsmouth Force Main:**

  Complete the installing 66-inch fiberglass force main pipe, and complete the shaft build-out work at the North Portal shaft that connects to the Portsmouth Tunnel.

  Perform improvements to the Portsmouth Tunnel to enable it to withstand surcharge pressures, and install level monitoring for operational controls.

  Install odor control facilities at the North Portal shaft and at the end of the Portsmouth Tunnel near CBWTP.

- **Sellwood CSO Pump Station / Lents Trunk Outfall #27:** Complete the construction of the Wet well, diversion structure, connections, force main, and control building. Install liner in the lower end of the Lents Trunk that will experience the most surcharging pressures. Test and bring system online.

D. CSO Operation and Maintenance Activities Planned

During the current fiscal year the City will continue the implementation of operation and maintenance practices that reduce the impact of CSOs on receiving streams. This Citywide effort is expected to complete the following estimated project work:

- Sewer Cleaning: 140 miles
- Sewer Inspection: 160 miles
- Catch Basin/inlet Cleaning: 12,000 catch basin/inlets

- Drainage Sump Cleaning: 2,000 sumps/sedimentation manholes
- Diversion Structure Inspections: Will be for maintenance purposes only because all diversions will be diverted to a controlled downstream facility or will meet the ASFO level of control on their own. Diversion inspections will be done once every two months during the year.

VI. Conclusions

This past fiscal year saw significant projects moving rapidly towards completion to achieve ASFO compliance on December 1, 2011. Many of the projects are now done and are online or will be online when the rest of the system is activated. Portland continues to expect successful implementation of the East Side CSO Program and the overall 20-year program to achieve the required control by December 1, 2011.

APPENDIX A

CITY OF PORTLAND - BES

CSO Capital Improvement Program Implementation Schedule

(Appendix A contains 37 pages including this title page)