CITY OF PORTLAND
COMBINED SEWER OVERFLOW PROGRAM

ANNUAL CSO PROGRESS REPORT TO DEQ

FISCAL YEAR 2009-2010

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

CITY OF PORTLAND
BUREAU OF ENVIRONMENTAL SERVICES

JUNE 30, 2010

Annual CSO Progress Report to DEQ for FY 2009-2010

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I. Summary

Portland's Combined Sewer Overflow (CSO) Program will complete in December 2010 the 19th year of the 20-year program designed to control all CSO discharges by December 2011. As of June 2009, the City estimates it has reduced the average annual CSO volume since 1990 from 6.0 billion gallons to 2.03 billion gallons per year (66% reduction). The last major reduction effort will be completed during the summer and fall of 2011.

During the past fiscal year (2009-10), 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 City has completed 24,900 feet of tunneling from the mining shaft at OMSI, and completed some of the remaining consolidation conduits that will bring CSO to the four drop shafts to the north: Alder, Steele Bridge, River Street, and Port Center.

This past fiscal year BES invested $107 million into the CSO Program. This was $65 million less than expected due to postponement of work on the Portsmouth Forcemain and cost savings on the East Side Tunnel. Next fiscal year, BES expects to invest $109 million as we complete the remaining projects in a timeframe that meets the 2011 deadline.

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 2010 include:

- **East Side CSO Tunnel**: The tunnel boring machine (TBM) completed the north drive to the Port Center Way Shaft on Swan Island. The TBM was then dismantled and barged back to the Opera Shaft where it began the south drive to the McLoughlin Shaft. The TBM completed 7,080 feet of tunneling for a total of 24,906 feet since the beginning of the project.
- **Tunnel Shafts**: Final structural concrete lining work completed at three of the six shafts, and began at the remaining three.
- **Consolidation Pipelines and Diversion Structures:** Completed several structures required to bring CSO to the major tunnel shafts.
- Completed 21 **Sustainable Stormwater Program** green infrastructure facilities that remove and infiltrate stormwater runoff from streets, parking lots, and roofs in the combined system.
- Since December 2006, eight overflow events have occurred from the West Side controlled outfalls – six during the winter season and two during the summer season.
- BES will be submitting the Post-2011 CSO Facilities Plan to DEQ by September 1, 2010 as specified in the ASFO.

The City of Portland has completed each of the 30 milestones required in the ASFO (see last page of Appendix A for full list) that have come due through June 30, 2010. 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 phase of controlling the Willamette River CSO outfalls. The significant activities we expect to complete next fiscal year ending June 30, 2011 include:

- Complete the East Side CSO tunneling drive south to the McLoughlin Shaft.
- Complete the buildout of all East Side CSO shafts.
- Complete construction on the Swan Island CSO Pump Station Phase 2 electrical and mechanical upgrades for 2011.
- Complete construction of the Portsmouth Force Main Segment 1 and most of the tunneling of Segment 2.
- Continue construction on the Balch Consolidation Conduit and shafts.

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 09-10	Projects Opened During FY 09-10
Combined Sewer Overflow	332	0
Maintenance and Reliability	738	146
Sewage Treatment Systems	514	55
Surface Water Management	338	100
Systems Development	334	42
Total	**2256**	**343**

At the end of fiscal year 2009-10, there were 2256 individual projects listed in the CIP and 343 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. Last year there were 339 CSO projects listed at the end of the year, this year 332 CSO projects are listed. This change occurred when some projects were transferred to the Maintenance & Reliability Program because their scope of work was reduced to only basement flooding instead of controlling CSO and basement flooding.

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 (these are referred to as the “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, 2010) from 4.8 billion gallons per year (1990 estimate) to about 2.03 billion gallons per year, based on average annual rainfall. This represents an annual system-wide reduction of nearly 66% 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. [Design completed and 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, 2009 and ending June 30, 2010 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 contained three ASFO milestones for completing Portland's 20-year CSO program. In total, there are 38 milestones beginning with the first CSO Progress Report required in 1995 all the way through the final report in 2012 that will demonstrate the completed system's compliance with the ASFO performance criteria. The FY 09-10 milestones was #30

In fiscal year 2010, BES addressed one ASFO milestone:

- Milestone #30 – 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."

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 09-10 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 has completed a draft of this report and will be submitting the final version to DEQ on September 1. The report is to be reviewed by the EQC for possible approval.

In addition, the ASFO also requires Portland to present the status of the CSO Program to the EQC, which is scheduled for the December 2010 EQC meeting.

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. Stormwater, and Treatment Systems Plans. With assistance from CH2M HILL for management and expertise support, and Brown & Caldwell for CMOM support, 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 FY10-11. The Stormwater System Plan, focused on the separated (non-combined) areas, began in 2009 and will require multiple years to complete.

CBWTP Facilities Plan Update

The Columbia Boulevard Wastewater Treatment Plant (CBWTP) Facilities Plan Update was completed in March 2010. This effort examined the liquid and solids processing necessary to meet NPDES requirements and manage expected loadings in 2011, 2015 and 2020. The report provides recommendations for improving secondary treatment processes (especially during wet weather loadings) and for chemically enhanced primary treatment (CEPT) for the CSO treatment system. The analyses provided in the report were used to support the information provided to DEQ and EPA for the NPDES Permit renewal.

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 09/10

During FY 09/10, the City continued the Downspout Disconnection Program in the East Willamette and Columbia Slough Watersheds. 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 586 properties. Of these properties, 386 were located in the original Cornerstone Project area defined in the 1994 CSO Plan and 218 were in the new Program area. This is estimated to remove about 14 million additional gallons of stormwater per year from the combined sewer system.

As of June 30, 2010, there were 26,080 properties representing 53,711 disconnected downspouts that have been approved through the Downspout Disconnection Program, removing about 600 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 a total estimated 1.28 billion gallons of stormwater removed from the system annually.

Sustainable Stormwater Management Program (SSMP)

BES has organized several parallel efforts to implement green solutions and stormwater inflow 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 to document how much the different 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. Two innovative Green Street projects were completed in FY09-10 with funds from IWWP. A Green Street curb extension at SE 13th and Spokane was constructed and combined with a traffic diverter to enhance bicycle and pedestrian safety. It manages approximately 7,000 square feet of street runoff. The second project is a series of 3 Green Street facilities on NE 7th and Davis that manages runoff from 13,700 square feet and demonstrates a new Green Street design approach.

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 are at 60% design phase. 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 almost thirty green streets facilities, two private stormwater retrofits, 756 LF of pipe replacement, and two sumps. Construction of the right-of-way elements is scheduled for early 2011 to be followed by construction of the private retrofits.

Sustainable Stormwater Management Program (SSMP) Projects

1% for Green (1%) Projects

Portland selected and implemented green street projects for "1% for Green" funding. Twelve new green street curb extensions were installed in partnership with the Bureau of Transportation to combine stormwater management with traffic and pedestrian safety improvements. The extensions are located in CSO areas throughout Portland. Three facilities in Multnomah Village of SW Portland manage a total of 29,500 square feet of street area; seven facilities on N Williams Street manage runoff from approximately 58,950 square feet of impervious surfaces; two additional facilities at SE 57th and Division Street manage runoff from 9,600 square feet of street area. Seven new green streets are anticipated for construction in FY 10-11.

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 in ecoroofs and green street facilities, street and yard trees, removing invasive vegetation and restoring native plants, and acquiring and protecting sensitive natural areas.

- One curb swale was installed at N Central and St. Johns St managing runoff from 18,800 square feet of street surface and was initiated as part of our Community Request Program.
- One green street curb extension was installed at N Channel Blvd., next to a multiuse path. The facility manages runoff from 8,500 square feet of street.
- Grey to Green incentive funds helped the city gain an additional 1acre towards it goal for ecoroofs.

Community Benefit Opportunity (CBO) Projects

Under this program, BES will install three new green street curb extensions. The three green streets are anticipated for construction in Portland's Sellwood area in late fall 2010.

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 and 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) will capture CSO discharges to Outfall 17 and convey the flow to the West Side CSO tunnel via the Nicolai drop shaft structure. This new pipeline size will be 84-inches in diameter and will be a micro-tunnel similar to the Southwest Parallel Interceptor. The upstream end of the BCC will be 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 also provide local basement flooding relief as well as collect CSO from the basin. The new alignment will require the BCC to be 7,000 feet in length.

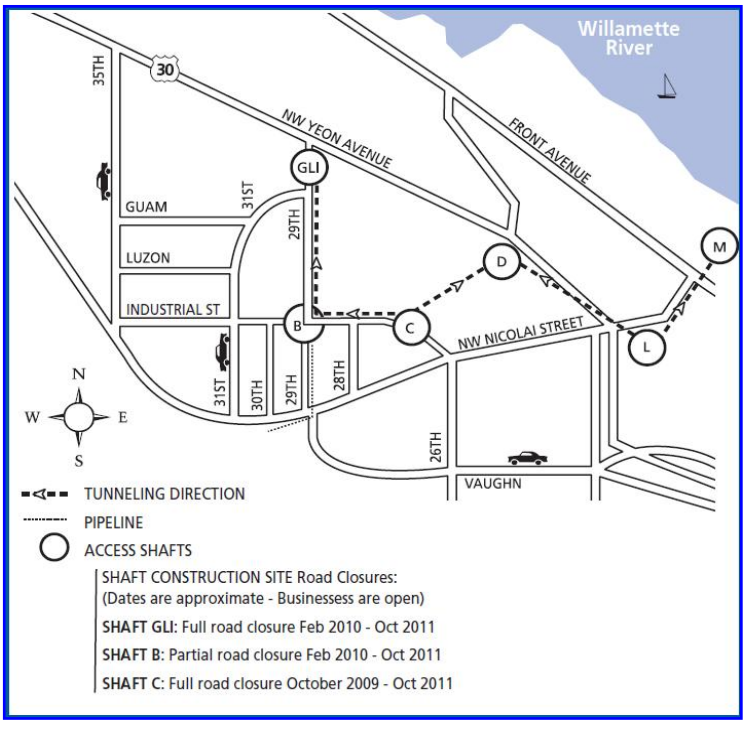
Design was completed in the spring 2009. Construction began in June 2009 with a projected completion scheduled for December 2010.

During FY2009-10, the contractor (JW Fowler) relocated utilities, completed ground improvements, and began constructing six tunnel access shafts for tunnel construction and future maintenance. JW Fowler is using a Cutter Soil Mixing (CSM) Machine to construct shaft walls in the extremely soft soils and hard gravels.. The CSM machine cuts out a panel in the soil, grinding and mixing cement into the soil to form a sturdy wall that supports the soil outside of the excavation allowing the shaft to be excavated. The contractor also used the CSM machine to strengthen soft soil along part of the conduit alignment to support the micro-tunnel boring machine (MTBM). The machine mixed cement with soil under NW 29th Avenue from NW Yeon to NW Industrial.

The contractor is using two micro-tunnel boring machines (MTBMs) to construct the Balch Consolidation Conduit's 84-inch and 54-inch diameter pipes. The project includes constructing six tunnel access shafts for the MTBMs, supplies and pipe segments. The MTBM will bore between tunnel shafts as pipe segments are pushed in behind it to make a watertight tunnel. .

The layout and schedule for the shafts and 84-inch micro-tunnel is shown in the figure to the right.

The second MTBM will construct 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 will be part of the work to be completed on the CBWTP–CBWWTF site for the 2011 deadline. Portland is rehabilitating the old CBWTP screenhouse to create a 150 MGD Wet Weather Headworks. This new facility will provide fine screening (1/4-inch openings) for 150 MGD of captured CSO flows. Construction began in fall 2009 and is scheduled to be completed in 2011.

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 will be 5.6 miles long, 22 feet in diameter, and 85 to 165 feet deep. Once construction is completed in 2011, the project will allow discharge 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, 2010.

Tunnel: The tunnel boring machine (TBM) completed the northern drive to the Port Center Shaft on November 1, 2009, and over a 4-month period was dismantled, removed, barged, repaired and rebuilt, and placed into the Opera Shaft to begin the southern drive to the McLoughlin shaft. 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 7,080 feet of tunneling during the reporting period (July 1, 2009 – June 30, 2010). A total of 24,906 feet of tunneling has been completed since the start of the East Side project.

Tunnel Shafts: Final structural concrete work began at the River, Port Center, and McLoughlin shafts. Construction of the final structural concrete lining completed at the Taggart, Alder and Steel Bridge Shafts.

Consolidation Pipelines and Diversion Structures:

Outfall 28 (Insley): No work occurred at this location for the reporting period. Construction crews will return in summer of 201l to make the final connection to the tunnel system.

Outfall 30 (Taggart): Support of excavation installed and excavation operations began.

Outfalls 33, 34, and 35 (Alder): No work occurred for the reporting period.

Outfall 36 (Alder): No work occurred at this location for the reporting period. Construction crews will return in summer of 201l to make the final connection to the tunnel system.

Outfalls 37 (Stark) and 38 (Oak): Began and completed the construction of the diversion structure at OF37.

Outfall 40: Initial work at this structure was completed. Construction crews will return in summer of 2011 to make the final connection to the tunnel system.

Outfall 41: Construction of the manhole structure to connect OF41 to the tunnel system began.

Outfall 43: The diversion structure work was initiated and completed during the reporting period. Construction crews will return in the summer of 2011 to make final connections to the tunnel system.

Outfall 44A: Installed support of excavation for the diversion structure, completed excavation and started the concrete buildout.

Outfall 46: The diversion structure work is complete until the final connection to the tunnel system is made in 2011.

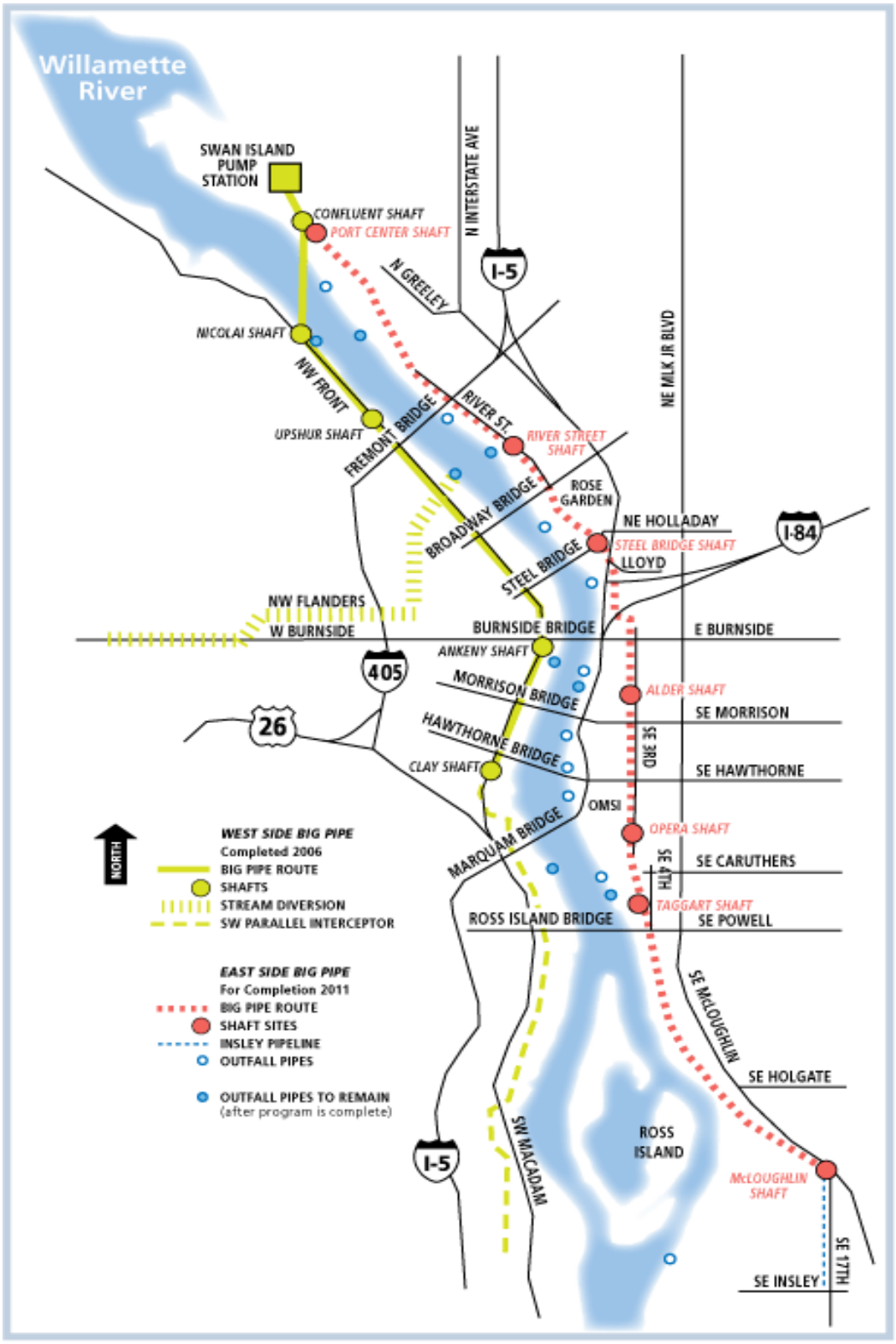
Swan Island CSO Pump Station

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 – is completed and in full operation. Startup testing was completed in the fall of 2006 for the multiple modes and conditions expected.

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

The construction contract was awarded to Stellar J Corporation during this reporting period. The contractor has spent the majority of the reporting period preparing submittals and ordering equipment. The contractor mobilized to the site during the period and began installing foundation supports for the pumps and process tanking. The majority of installation work will occur next reporting period.



Map of Willamette CSO Tunnel System Route and Drop Shafts

Portsmouth Force Main

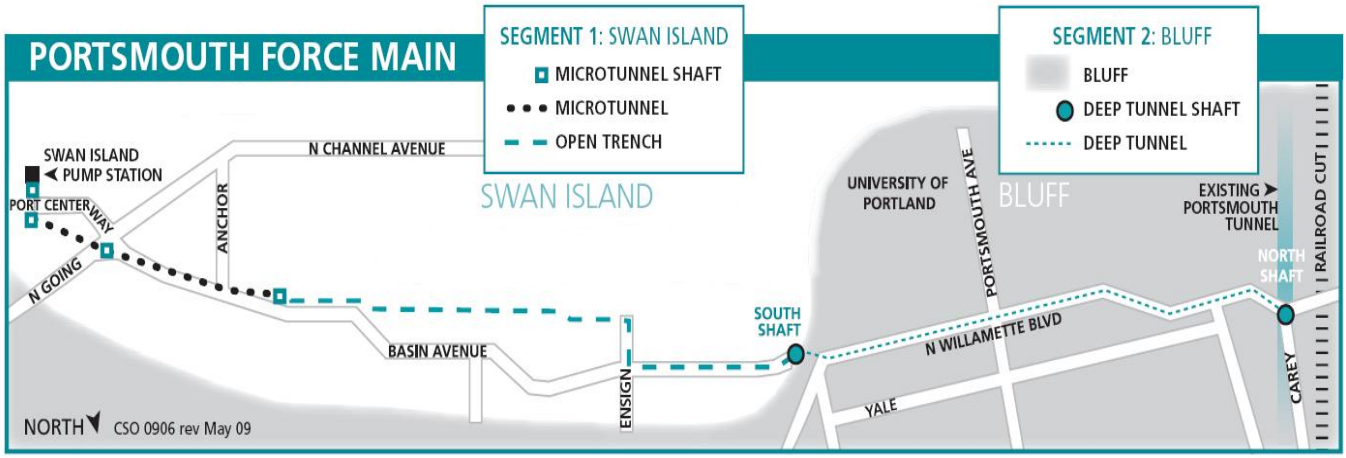
The Portsmouth Force Main will connect the Swan Island Pump Station to the Portsmouth Tunnel interceptor and direct CSO to the CBWTP for treatment. The force main system will carry up to 120 MGD of CSO flow and will be complete in 2011.

The final design scope of work includes a single 66-inch force main from the Swan Island CSO Pump Station to the Portsmouth Tunnel. For narrative purposes, the force main alignment has been broken into two distinct segments:

- Segment 1: Swan Island
  - 2,900 feet of 84-inch micro-tunnel construction
  - 6,977 feet of 66-inch open cut construction
- Segment 2: Bluff
  - 160 feet of 66-inch open-cut construction
  - 5,959 feet of 11-foot diameter deep tunnel

During fiscal year 2009-10, the project team completed:

- Construction began on both segments.
- For Portsmouth Force Main Segment 2 project, two tunnel shafts were constructed and approximately 250 feet of tunnel was installed.
- For Portsmouth Force Main Segment 1 project, four microtunnel shafts were constructed and approximately 2,900 feet of microtunnel work was completed. Began the installation of the 66 inch steel force main pipe within the microtunnel. In addition, several utility relocates were completed and approximately 140 feet of open cut 66" steel force main pipe 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 have been and will be implemented in the Sellwood and Lents Basins to control CSO to the required ASFO level. There are three projects remaining to control CSO in this area by December 2011:

Sellwood Reliever

This project provided a new reliever sewer in the center of Sellwood basin and is one of the projects required to eliminate CSOs to the Sellwood portion of OF27 in accordance with the ASFO. This project was originally defined in the Sellwood Cornerstone Project.

The scope of work included constructing a new 24" to 36" diameter combined sewer pipeline along SE 11th Ave and Umatilla Street and eliminating two diversion structures.

Construction began in November 2007 and was completed October, 2008. Two in-system diversions have been removed; one located at SE 11th and SE Nehalem St., and a second located at SE 15th and SE Tenino St.

Sellwood Interceptor

This project involves re-aligning and upsizing the existing Sellwood gravity interceptor sewer that conveys combined sewage from the Sellwood Basin to the Umatilla Pump Station. The interceptor runs along a north-south orientation beginning north of the Umatilla Pump Station approximately 500' and stretches to the south approximately 1400'. It parallels the Oregon Pacific Railroad along the east bank of the Willamette.

The replaced interceptor was in fair to poor condition. During storm events, it overflowed to the river via OF27 and OF26. The replaced interceptor's previous location posed a significant access problem for maintenance crews due to limited access along the railroad and steep slopes to the west. The new location alleviated these issues and therefore required re-alignment of the railroad.

The project is related to the Sellwood/Lents CSO Pump Station / Lents Trunk OF27 Project which the interceptor overflows into during large storms.

Accomplishments in FY09-10 include beginning construction of the Sellwood Interceptor, and removal of six existing overflow structures. These included:

- SE199 (SE Tenino and SE Grand Ave)
- SE198 (SE Umatilla and Grand Ave)
- SE185 (SE Harney and Grand Ave)
- SE187 (SE Sherrett and Grand Ave)
- SE189 (SE Clatsop and Grand Ave)
- SE192 (SE Marion and Grand Ave)
- SE193 (SE Linn and Grand Ave)

Temporary emergency relief for the interceptor and Umatilla Pump Station has been constructed at SE Umatilla and Grand Ave as an overflow connection to the existing OF27. Permanent CSO capture for the Interceptor sewer (and thereby Umatilla PS) will be provided via an overflow structure to the future Sellwood CSO Pump Station. When this new CSO pump station is complete, the temporary emergency relief for the interceptor and Umatilla Pump Station (to OF27) will be abandoned as part of the work.

Sellwood CSO Pump Station / Lents Trunk Outfall #27 Control System

BES engineering staff developed a cost-effective and innovative way to control CSO discharges to Outfall 27 in the Sellwood area by converting the 1922 72-inch tall by 56-inch wide Lents Trunk Sewer into an inline storage and designed the Sellwood CSO Pump Station to dewater it. This project will replace more expensive wet weather upgrades at Umatilla and Harney Pump Stations and eliminate the need to construct a large inline storage facility further upstream in the Lents basin. The project includes lining 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 FY09-10, the project team completed 100% design documents and began construction of the wet well excavation and support system.

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.

- **Sewer cleaning**
  - Combination Sewers 44 miles
  - Sanitary Only Sewers 199 miles
  - Total 143 miles

- **CCTV Inspection**
  - Combination Sewers 68 miles
  - Sanitary Only Sewers 167 miles
  - Total 235 miles

- **Root Treatment** *(sometimes included in cleaning numbers)*
  - Combination Sewers 33 miles
  - Sanitary Only Sewers 0.2 miles
  - Total 33 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 100) is inspected once a week. Diversions that overflow to a downstream facility (approximately 50) 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 5,000 diversion inspections last fiscal year.

E. Public Involvement, Education and Outreach Activities:

The focus of CSO public involvement, education and outreach in FY 2009-2010 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

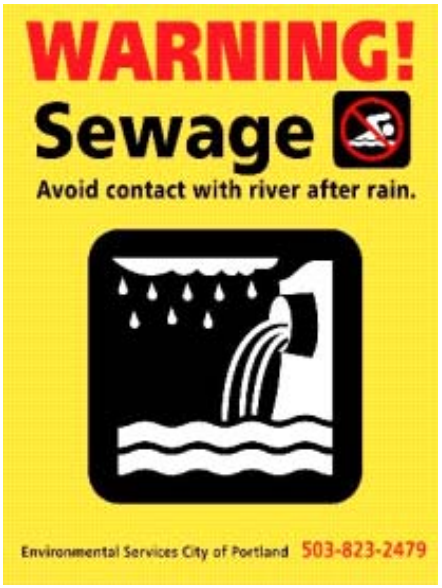
Community Benefit Opportunity Program

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

Environmental Services' River Alert system notifies the public of CSO events when they 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 the rainy season between October 15 and May 15, the signs remain 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 fax and 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 2009-2010, Environmental Services issued the following 18 media releases related to CSO projects:

- 8 CSO advisories during the summer notification period
- 8 stories about the CSO construction program

Media Events

- On April 20, 2010, Environmental Services and the City's Balch Consolidation Conduit Project contractor staged a public demonstration of the micro-tunnel boring machine used on the project for stakeholders, reporters and invited guests.
- On Wednesday, February 17, 2010, Environmental Services and the City's Balch Consolidation Conduit Project contractor held a public demonstration of the cutter soil mixing machine used on the project. It was the first use of the technology on an Oregon construction project.

- On December 2, 2009, Environmental Services invited media to view removal of the tunnel boring machine mining the East Side CSO Tunnel after completion of the machine's north drive.
- On December 16, 2009, Environmental Services publicized barging of the 530 ton East Side CSO tunnel boring machine from Swan Island to the Opera Shaft to prepare for the south tunnel drive.

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 five subsections used for the previous year's efforts.

A. ASFO Milestones to be Achieved

In fiscal year 2010, BES will address two ASFO milestones:

- 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."

- 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 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 12.a. This facilities plan shall be subject to approval by the Environmental Quality 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 2010
- Post-2011 CSO Facilities Plan – Due to DEQ September 1, 2010.

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 2010.

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:

- During FY 10-11, the **Expanded Downspout Disconnection Program** will continue to disconnect downspouts at homes as well as small multifamily properties in the East Willamette watershed served by the combined sewer.

- **Sustainable Stormwater Management Program**: Seven new green streets are anticipated for construction in FY 10-11, including three green streets to be constructed in Portland's Sellwood area in late fall 2010.

- **Balch Consolidation Conduit (BCC):** The BCC project began construction in June 2009 and will continue throughout this next fiscal year. Construction is expected to be completed December 2010.

- **East Side CSO Tunnel Projects**
  - **East Side Tunnel:** Complete the mining for the remaining 4,000 linear feet of tunnel including all appurtenant work to place the tunnel into operation.

- **Tunnel Shafts:** Complete the buildout of the McLoughlin, Opera, River, and Port Center Shafts.
- **Consolidation Pipelines and Diversion Structures:** Begin the work to transfer flow from each of the outfall structures to the tunnel system. This work will be completed shortly after the next reporting period.

- **Swan Island CSO Pump Station:**

  Complete the 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:**

  Segment 1:

  - Complete the installation of the 66-inch force main pipe within the completed microtunnel.
  - Complete the installation and testing of the remaining 6,800 feet of 66-inch cut and cover steel force main pipe and appurtenant facilities.

  Segment 2:

  - Complete the mining for the remaining 6,700 feet of tunnel construction. Install the 66-inch fiberglass force main pipe with the 11 foot diameter tunnel.

- **Sellwood Interceptor:** Project will be completed and functional.
- **Sellwood CSO Pump Station / Lents Trunk Outfall #27:** Wet well, diversion structure, connections, force main, and control building shell to be constructed

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: 13,000 catch basin/inlets
- Drainage Sump Cleaning: 2,000 sumps/sedimentation manholes
- Diversion Structure Inspections: Perform weekly inspections on all active diversion structures that directly overflow to the receiving stream and do not have automatic monitors/alarms; perform routine inspections on all other active diversions on a bi-monthly (once per two months) basis or as needed for maintenance and proper performance

E. FY 10-11 Public Involvement Activities Planned:

Environmental Services will continue to educate and identify opportunities for Portland residents, businesses and neighborhood groups to participate in CSO and watershed enhancement projects. The bureau will work closely with neighborhood and business associations and other community groups to raise awareness of the CSO program, gain active public input on project decisions, and involve more citizens, businesses and neighborhood groups in watershed protection and restoration efforts. Activities in the coming year include:

- Working with citizen committees and work groups to address issues regarding CSO project construction plans and construction mitigation measures. This will include continued community involvement and outreach for the Portsmouth Force Main construction now underway.
- Continuing to conduct site visits to areas near the East Side CSO Tunnel and the Portsmouth Force Main, Oak Basin, Balch Consolidated Conduit, and Sellwood Projects.
- Continuing to give presentations to organized community groups and trade groups.
- Providing opportunities for face-to-face discussions, such as open houses. This includes two open houses during the design of the Portsmouth Force Main Odor Control Facility.
- Developing informational materials that explain CSO projects, timelines, construction mitigation plans and opportunities to enhance impacted communities.
- Providing public involvement support for Willamette Stormwater Inflow Control Projects to encourage and assist commercial and industrial property owners in the combined sewer area to remove stormwater from the combined system by creating on-site stormwater infiltration facilities that use more natural systems like swales, wetlands and native vegetation to detain and treat stormwater.
- Providing educational CSO classroom presentations and assembly programs, and developing a new CSO classroom activity that focuses on the history of sewers and implementation of CSO solutions in Portland,
- Providing information to the public about the CSO program through special displays in high traffic areas such as OMSI and businesses affected by construction. The CSO Exhibit at OMSI was upgraded last fiscal year to reflect new projects and to include the East Side CSO Tunnel Projects.
- Providing presentations and guided “tours to the fence” of project sites.
- Continuing the CSO River Alert public notification program.
- Distributing citywide newsletters and quarterly water/sewer utility bill inserts that inform citizens about the CSO program and projects, watershed restoration activities and how citizens help protect Portland watersheds.

VI. Conclusions

This past fiscal year, the City continued pressing towards completing the multiple projects necessary to achieve ASFO compliance on December 1, 2011. Portland continued successful implementation of the East Side CSO Program, especially by completing the northern tunnel drive and initiating the final southern leg of tunneling. Due to all the CSO project activities, the capital expenditure for the CSO Program was about $107 million this past fiscal year, and is expected to be $120 in the next fiscal year. These costs are in addition to the approximate $1 billion in capital costs already expended for the completed Westside, Cornerstone Projects and the Columbia Slough CSO systems.

The Bureau has also developed plans for projects after 2011 that will help maintain the "further reductions" Portland expects to achieve in 2011 that will exceed the ASFO standards. The ASFO requires the City to submit an updated Facilities Plan in September 2010 to identify how the CSO system will continue to provide better-than-ASFO required levels of CSO control. These future, post-2011 projects are expected to be almost entirely "sustainable stormwater management" facilities designed to infiltrate and treat additional stormwater off of difficult impervious surfaces while providing vegetation and green spaces for habitat and public amenities. To prepare for this post-2011 effort, BES is implementing many pilot and grant projects via the Sustainable Stormwater Program to develop a full base of experience and proven performance that will serve the Bureau in achieving the post-2011 goals for continued stormwater reduction and increased CSO control.

APPENDIX A

CITY OF PORTLAND - BES

CSO Capital Improvement Program Implementation Schedule

(Appendix A contains 37 pages including this title page)