

This facility plan summarizes preliminary engineering that has been completed by King County for improvements to control combined sewer overflows (CSOs) from the Barton and Murray CSO basins in West Seattle (see Figure 2.1). The goal of the improvements is to achieve CSO control objectives defined by the State of Washington and described in King County's June 2008 *CSO Control Plan Update*. The primary control objective is to limit overflows of untreated sewage to an average of no more than one per year at each overflow location.

2.1 PROBLEM IDENTIFICATION

King County provides sewage treatment for a number of municipalities. The county's extensive regional conveyance system conveys wastewater from the municipalities to county treatment plants. The older sewer basins use combined sewers that convey sanitary and stormwater flow together in a common pipe. The stormwater flow component entering the sewer during and following a rain event can be significant and can exceed the system's conveyance capacity. Numerous overflow points in the combined system allow the excess flows (CSOs) to be diverted to a receiving water body. The county is working on projects to reduce the number of such overflow events.

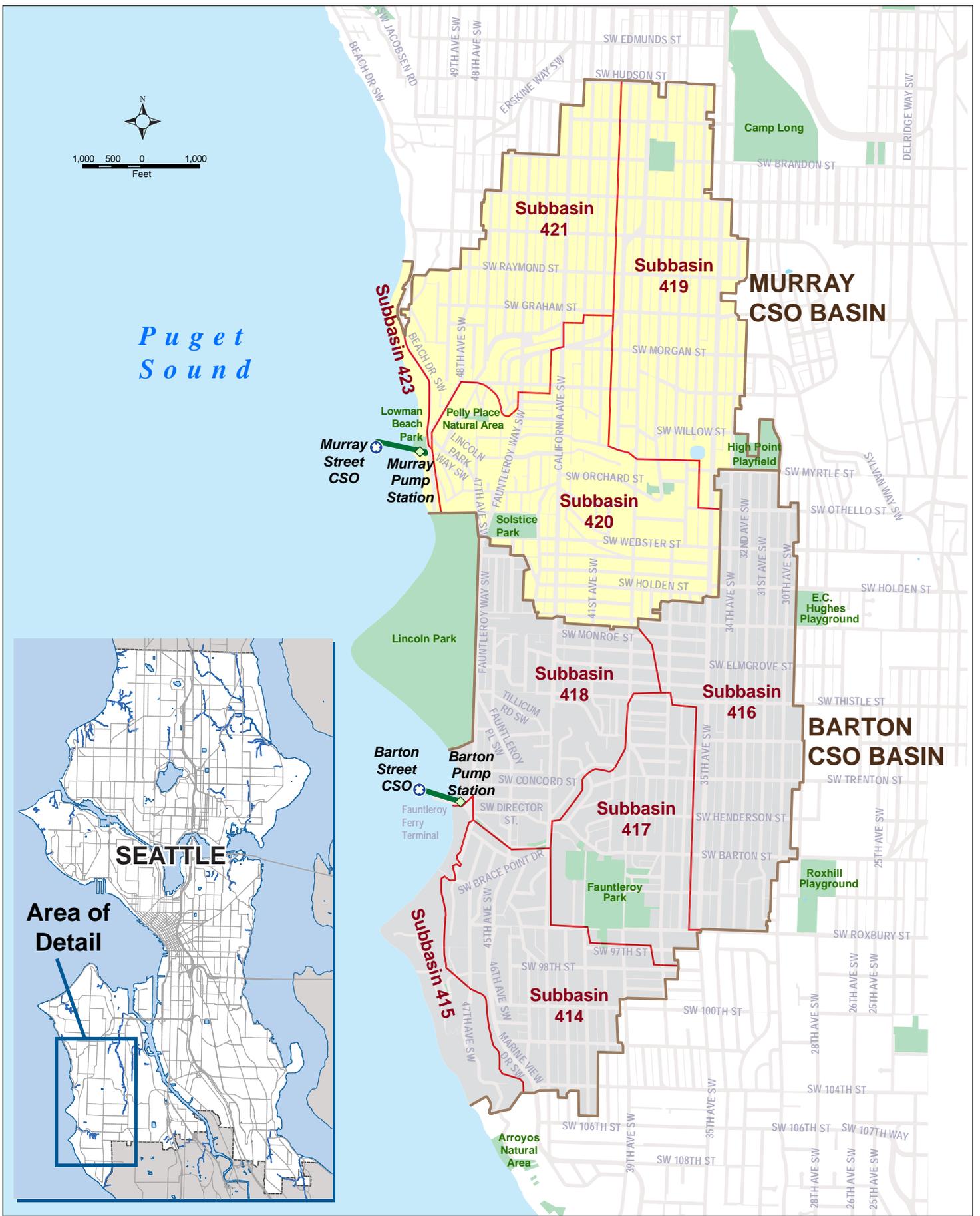
The existing King County conveyance system has inadequate capacity to convey all storm water and sewage flows from the Barton and Murray CSO basins in West Seattle to the West Point Treatment Plant during heavy rainfall events. When flows from these basins exceed the peak capacity of the Barton and Murray pump stations (near the Fauntleroy Ferry Terminal and Lowman Beach Park, respectively), the excess is discharged untreated through CSO outfalls to Puget Sound.

Between the years of 2000 and 2007, the Barton CSO basin experienced an average of four untreated overflows per year. During this same time period, the Murray CSO basin experienced an average of five untreated overflows per year.

2.2 PROJECT BACKGROUND

2.2.1 CSO Control Requirements

CSO control projects for the Barton and Murray CSO basins will be developed to meet established CSO control requirements. Specifically, the improvements will reduce untreated sewage overflows to an average of no more than one event per year on a long-term average.



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BARTON AND MURRAY COMBINED SEWER OVERFLOW CONTROL FACILITIES PLAN

DRAFT – February 2011

Figure 2.1.
BARTON AND MURRAY CSO BASINS VICINITY

2.2.1.1 Federal Clean Water Act and National Pollutant Discharge Elimination System

In 1972, the federal Clean Water Act (CWA) was adopted. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters. This objective translates into two national goals: to eliminate the discharge of pollutants into the nation's waters; and to achieve and maintain fishable and swimmable waters. One way that the first goal is being achieved is through the National Pollutant Discharge Elimination System (NPDES) permit program. The second goal is being addressed by developing pollution control programs to meet specific water quality standards for water bodies.

The CWA requires all wastewater treatment facilities and industries that discharge effluent into surface waters to have an NPDES permit. In Washington State, NPDES permits are issued by the Washington State Department of Ecology. The permits define appropriate technologies for discharging to surface waters and establish limits on the quality and quantity of effluent discharged from point sources such as treatment plants, CSOs, and industrial facilities.

2.2.1.2 CSO Control Regulations

2.2.1.2.1 *State Regulation*

After adoption of the CWA and implementation of the NPDES program, CSOs were recognized as a unique category of discharge that was not adequately covered by the federal or state regulations. In 1984, Ecology introduced legislation requiring agencies with CSOs to develop plans for "the greatest reasonable reduction [of CSOs] at the earliest possible date." In January 1987, Ecology published a new regulation (WAC 173-245) that defined the greatest reasonable reduction in CSOs as "control of each CSO such that an average of one untreated discharge may occur per year." State water quality mixing zone standards allow a once-per-year exemption for the "one untreated discharge" from CSO facilities. The new regulation also defined standards for appropriate technology to use in treating CSOs, and water quality-based effluent limits apply to treated CSO discharges where needed.

Regulations that Affect CSO Control Planning

Clean Water Act (CWA)—Adopted in 1972 to eliminate the discharge of pollutants into the nation's waters and to achieve and maintain fishable and swimmable waters.

National Pollutant Discharge Elimination System (NPDES)—The Washington State Department of Ecology implements the CWA by issuing NPDES permits to wastewater agencies and industries that discharge effluent (including CSOs) to water bodies.

Water Quality Standards—To implement the CWA, Ecology has developed biological, chemical, and physical criteria to assess a water body's health and to impose NPDES permit limits accordingly.

State CSO Control Regulations—Ecology requires agencies to develop plans for controlling CSOs so that an average of no more than one untreated discharge per year occurs at each location.

Wet-Weather Water Quality Act of 2000—The U.S. Environmental Protection Agency (EPA) requires agencies to implement Nine Minimum Controls and to develop long-term CSO control plans.

Sediment Quality Standards—Ecology developed chemical criteria to characterize healthy sediment quality and identified a threshold for sediment cleanup.

Endangered Species Act (ESA)—Multiple species that use local water bodies where CSOs occur have been listed as threatened under the ESA.

2.2.1.2.2 Federal Regulation

The U.S. Environmental Protection Agency's (EPA's) 1994 CSO Control Policy was codified as the Wet Weather Water Quality Act of 2000 (H.R. 4577, 33 U.D.C. 1342(q)). This act requires implementation of "nine minimum controls" for CSOs and the development of long-term CSO control plans. The purpose of the nine minimum controls is to implement early actions that can improve water quality before more expensive capital projects in the control plan are built. Agencies must show that water quality standards are met after implementation of their CSO control plan. In King County, the requirements of this act are incorporated in the NPDES permit for the West Point plant.

2.2.1.2.3 King County Regional Wastewater Services Plan

In 1999, King County adopted the Regional Wastewater Services Plan (RWSP; King County, 1999b), a 30-year wastewater comprehensive plan. Policies in the RWSP are intended to guide King County in controlling CSO discharges so that all CSO locations meet state and federal regulations. The policies call for regular assessment of CSO projects, priorities, and opportunities using the most current studies. Another CSO control policy addresses the cleanup of contaminated sediments near county CSOs. The policy directs the county to implement its long-range sediment management strategy and, where applicable, to participate with partners in sharing responsibilities and costs of cleaning up sites such as the Superfund sites in the Lower Duwamish Waterway.

2.2.2 History of CSO Control in King County

In 1958, the Municipality of Metropolitan Seattle (Metro) was formed to clean up the waters of Lake Washington and the Seattle waterfront. In the 1960s, Metro assumed ownership of the City of Seattle's wastewater treatment plants and portions of its sewer system and then built large pipes, called interceptors, to carry regional wastewater from local systems to the treatment plants. In 1994, King County assumed Metro's responsibilities for regional wastewater management. Regional improvements in collecting, conveying, and treating wastewater that were made after the formation of Metro continue to be effective despite decades of population growth and development.

Metro adopted the *Combined Sewer Overflow Control Program* in 1979. Since adoption of this first program, CSO control plans have been updated as needed to respond to evolving CSO regulations, including Ecology's control standard of no more than an average of one untreated discharge per year at each CSO location. The most recent update to the King County CSO Control Program is described in the June 2008 *CSO Control Plan Update* and the 2008 RWSP Annual Report.

Strategies for reducing or mitigating the effects of CSOs include pollution prevention through source control, stormwater management, and operational controls to transfer as much CSO flow as possible to regional treatment plants; upgrades of existing facilities; and construction of CSO control facilities.

Construction of CSO control facilities in the region began in the late 1970s. So far, about \$360 million (2008 dollars) has been spent to control CSOs and another \$400 million is

planned to implement the CSO control projects in the long-term control plan approved in 1999 as part of the RWSP. Many early projects involved sewer separation, flow diversion, and storage tunnels. Most current and future projects involve construction of conveyance improvements, storage tanks, and treatment facilities.

2.2.3 Current CSO Control Status in King County

Since 1988, when systematic monitoring and measuring of CSO flows began, King County's CSO control efforts have reduced CSO volumes from an estimated 2.4 billion gallons per year to approximately 900 MG per year (see Figure 2.2). Control facilities that were under construction prior to RWSP adoption—the Mercer/Elliott West and the Henderson/Norfolk CSO control systems—were brought online in 2005.

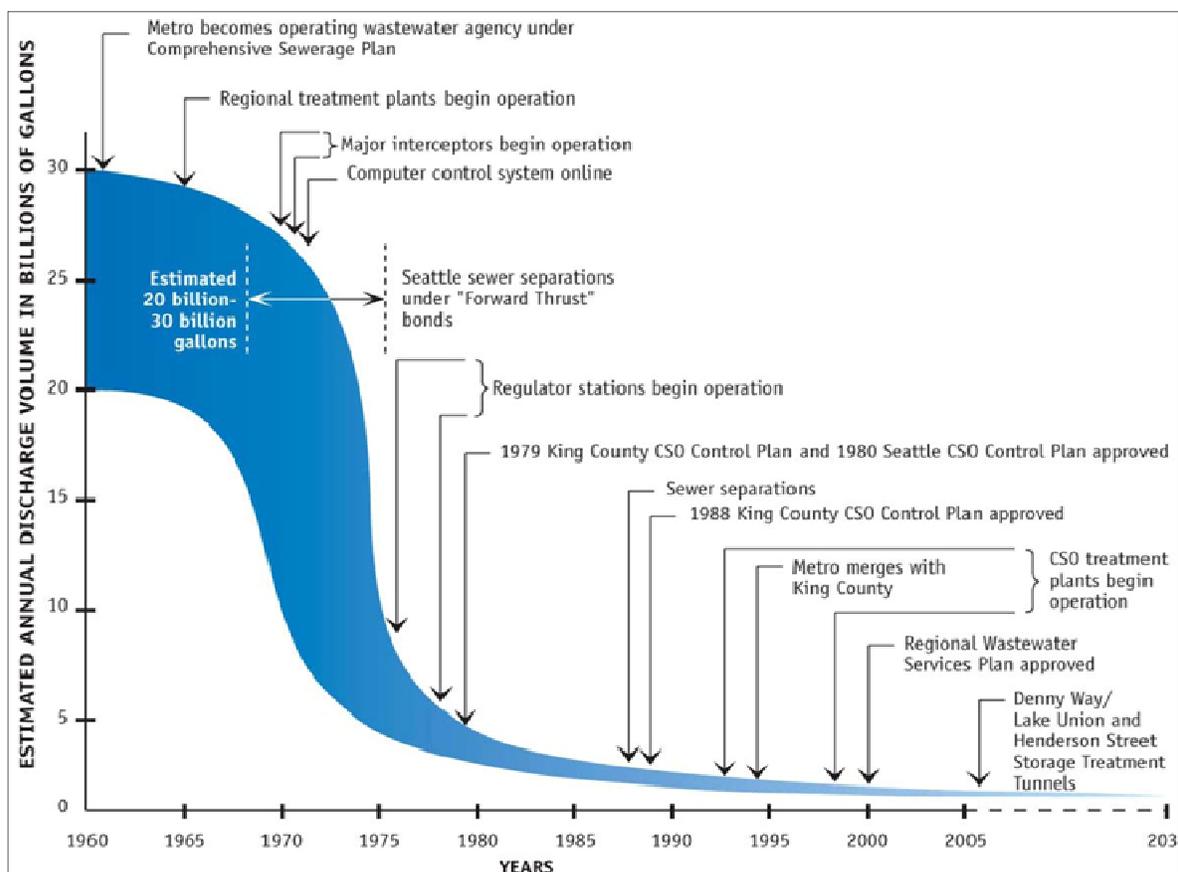


Figure 2.2 King County CSO Control Program Overview

According to the 2008 RWSP annual report, 16 of King County's 38 CSOs are controlled to Ecology's standard and two others (Denny and Dexter) are expected to achieve control after startup adjustments and modifications are made to the system. The remaining 20 uncontrolled CSOs will meet state standards as capital improvement projects are completed between 2013 and 2030. In setting schedules for implementing CSO control projects, the RWSP gives highest priority to locations with the greatest potential to impact human health, bathing beaches, and species listed under the Endangered Species Act. Figure 2.3 shows CSO control project priorities, as taken from the 2008 CSO Control Plan Update.



Figure 2.3 CSO Control Project Priorities

2.2.4 Previous Studies

King County and its predecessor agency Metro (the Municipality of Metropolitan Seattle) have consistently relied on scientific information to inform their wastewater management decisions. When information has not been available, they have initiated or participated in special studies to develop the needed data. This section describes the foundational studies that have shaped King County's decisions on CSO control.

2.2.4.1 1958 Metropolitan Seattle Wastewater and Drainage Study

Beginning with the 1958 *Metropolitan Seattle Wastewater and Drainage Study*, regional agencies have collaborated on studies to identify major environmental protection needs and to identify and prioritize corrective actions. This study recognized that providing better wastewater management would result in the most environmental improvement. As part of a larger three-stage schedule of projects, this study recommended a program of sewer separation and storage, as needed, to control overflows in the City of Seattle.

2.2.4.2 1978 Area-Wide Section 208 Water Quality Plan

In the late 1970s, Metro completed a two-year water quality investigation under Section 208 of the CWA. Toxic chemicals were identified as one of the five main water quality problems facing the Seattle-King County region. The plan recommended CSO control as part of improved wastewater management and identified the need for more understanding of the toxic impacts of CSOs on the local environment.

2.2.4.3 1979–1984 Toxicant Pretreatment Planning Study

In 1979, Metro, with the support of the EPA and Ecology, initiated a 5-year, \$7-million (in 1979 dollars) study—the *Toxicant Pretreatment Planning Study*—to develop a better understanding of what toxic chemicals were present in the local environment and wastewater, what the impacts of these toxicants were, and the treatability of these flows. A scientific advisory panel provided advice, oversight, and review during the study. The study recommended that CSO control should be part of a coordinated Elliott Bay Action Plan and that source control, including enhancing Metro's pretreatment program, should be a priority.

2.2.4.4 1983 Water Quality Assessment of the Duwamish Estuary

Because of potential conflict among uses of the Duwamish Waterway, the EPA and Ecology have classified this estuary as a high-priority study area. In 1982, both agencies identified the Duwamish as having one of the four worst water quality problems in Washington.

As the designated water quality management agency for the Green/Duwamish basin, Metro was awarded a grant to inventory pollutants impacting the waterway and to develop a strategy for improved pollution control. The 1983 *Water Quality Assessment of the Duwamish Estuary* documented this work. This assessment synthesized the findings of the Duwamish studies performed through July 1982. Public input and interagency task force review comments were considered in developing a ranked list of beneficial uses for the estuary. Mass balances were performed for 20 parameters to identify pollutant impacts on beneficial uses.

Upstream sources were found to contribute more than two-thirds of the total sediment, iron, and mercury load, as well as much of the organic carbon and pesticides. Major negative impacts on beneficial uses were attributed to ammonia, residual chlorine, copper, lead, mercury, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). Temperature, dissolved oxygen demand, nitrite, cadmium, DDT, pathogens, and sediments were found to produce only minor effects.

The Renton Treatment Plant (now called the South Treatment Plant) was found to contribute nearly 80 percent of the total ammonia load. The planned 1986 diversion of plant effluent out of the Duwamish was expected to result in marked reductions in ammonia, chlorine, dissolved oxygen demand, nitrite, and cadmium impacts on the Duwamish. Although CSOs were found to be a source of all the pollutants measured, their contribution was comparatively small. While concentrations of toxicants in the CSO flows were found to be relatively high, the small annual overflow volume made them only a minor source of contaminants. One exception was fecal coliform bacteria. An estimated 80 percent of the total pathogens released to the estuary were estimated to originate from CSOs.

The most significant finding was that most metal and organic toxicants in the estuary could not be attributed to documented sources. This shifted attention to the heavy industrial and commercial activity along the river. CSOs were identified as a minor contributor to the larger pollution problem and CSO control was recommended as a part of the solution.

2.2.4.5 1988 Draft Elliott Bay Action Plan

In 1985, the Puget Sound Estuary Program was formed to minimize toxic chemical contamination of Puget Sound and to protect its living resources. The Urban Bay Action Program, an element of the Puget Sound Estuary Program, developed the *1988 Action Plan* (King County, 1988) for the Elliott Bay Action Program. Its objectives were as follows:

- Identify specific toxic areas of concern in Elliott Bay and the Duwamish Waterway based on chemical contamination-associated adverse biological effects.
- Identify historical and ongoing sources of contamination.
- Rank toxic problem areas and sources (to the extent possible) in terms of priority for development of corrective actions.
- Implement corrective actions to reduce or eliminate sources of ongoing pollution and restore polluted areas to support natural resources and beneficial uses.

Through early accomplishments of the Elliott Bay Action Program, most known direct industrial discharges to the bay and river were terminated or routed to the municipal sewer system under permits. The remaining ongoing contaminant sources were believed to include contaminated groundwater, storm drains, CSOs, and a few unidentified direct discharges.

To characterize contaminant inputs from CSOs and storm drains, sediment was collected from the downstream end of seven CSOs, 20 storm drains, and 15 combination CSO/storm drains. These in-line sediments were compared to offshore sediments to evaluate CSO and storm drain contributions to the contamination in priority areas and stations. Ten priority

drainages were identified for source-control activities. Control of direct discharges and stormwater sources were identified as the greatest needs; these controls were expected to improve CSO discharge quality.

2.2.4.6 1988–1996 Metro Receiving Water Monitoring Program

In Administrative Order DE-84-577, Ecology instructed Metro to develop and implement a plan for monitoring receiving waters in the vicinity of its primary treatment plants—West Point, Alki, Carkeek, and Richmond Beach—and in other point-source discharge areas. (The Renton plant provided secondary treatment.) The proposed plan included quarterly to biennial monitoring at a range of stations near the treatment plants as follows:

- Water column surveys of fecal coliform and enterococcus bacteria.
- Sub-tidal sediment surveys including benthic taxonomy and amphipod bioassays.
- Analysis of conventional constituents (particle size distribution, total organic carbon, oil, and grease), metals, and extractable organic priority pollutants, plus a survey.
- Intertidal monitoring of water for bacteria, and monitoring of sediments for metals and extractable organic priority pollutants.
- Analysis of clam and algae tissue samples for the presence of bacteria, metals, and extractable organic priority pollutants.

This monitoring program was approved by Ecology on April 5, 1988. Data were reported to Ecology as quality assurance/quality control was completed and were summarized in annual status reports. The monitoring program was implemented until the 1996 NPDES permit was issued for the West Point plant, which was upgraded to provide secondary treatment after closure of the Richmond Beach plant. Since 1996, Metro has focused its monitoring program on collecting data on key parameters that could be used in long-term trend assessments. In parallel, an ambient monitoring program was implemented to provide background data that could be compared to the point-source monitoring data.

These monitoring efforts affirmed that, while CSO control should be part of the solution, it would not bring the largest benefit.

2.2.4.7 1988–1997 Metro/King County CSO Discharge and Sediment Characterization Study

In approving Metro's 1988 CSO control plan, Ecology required CSO and sediment characterization in order to obtain additional information for setting site-control priorities and a control project schedule. The approved monitoring plan called for taking four discharge samples at five active overflow sites per year until all the sites had been sampled. This sampling was completed in 1994. Sediment sampling was also completed at the rate of five sites per year. Additional sediment sampling was completed in 1997 to meet new state Sediment Management Standards and attendant testing protocols.

Sediment sampling confirmed that local sediments had been significantly impacted by contamination from many sources. To improve understanding of sediment contamination, the

county made it a focus of both the 1999 CSO *Water Quality Assessment for the Duwamish River and Elliott Bay* and the 1999 *Sediment Management Plan*.

2.2.4.8 1999 Combined Sewer Overflow Water Quality Assessment for the Duwamish River and Elliott Bay

King County completed the 1999 CSO *Water Quality Assessment for the Duwamish River and Elliott Bay* with support from a large stakeholder group and a peer-review panel. The assessment reviewed the health of the Duwamish River and Elliott Bay and the effects of CSO discharges. A computer model was developed to predict existing and future water and sediment quality conditions, and a risk assessment was undertaken to identify risks to aquatic life, wildlife, and human health.

The Water Quality Assessment affirmed that CSO pollution is a small part of a larger problem, mainly because of the low pollutant concentrations in CSOs and the brief and infrequent exposure of the estuary to CSOs. It recommended that CSO control continue to meet state regulations and helped determine the priority of CSO projects. It recommended that locations with greater potential for human contact—the Puget Sound beaches—be controlled first.

2.2.4.9 1999 Sediment Management Plan

The *Sediment Management Plan* (King County, 1999) assessed areas near seven county CSOs listed on the Washington State list of contaminated sites. These areas were assessed for their risk, preferred cleanup approach, partnering opportunities, and potential for recontamination after remediation.

The *Sediment Management Plan* highlighted the need for more information about CSOs as a contributor to contamination. The Sediment Management Program was formed to implement the Plan and any subsequent projects developed in the broader context of wastewater planning. The program addresses sediment quality issues near CSO discharges and treatment plant outfalls, evaluates and addresses wastewater treatment sediment quality issues, and incorporates sediment quality considerations into the County's comprehensive long-term planning.

2.2.4.10 1999 Regional Wastewater Services Plan

King County's 1999 RWSP presents policies to guide the County in controlling CSO discharges so that all CSO locations meet state and federal regulations, as described in Section 2.2.1 of this facility plan.

2.2.4.11 2000 and 2008 CSO Control Plan Updates

The 2000 *CSO Control Plan* (King County, 2000) documents King County's compliance with state and federal CSO requirements and updates the CSO Control Plan from the RWSP. Updates include the following:

- Redefining the definition of a CSO event.
- Studying alternative methods for CSO control and treatment.

- Researching potential total maximum daily load requirements.
- Developing watershed management programs.
- Studying sediment contamination.
- Developing a sediment management plan.
- Developing a CSO posting and notification program.
- Listing Chinook salmon under the Endangered Species Act.

The 2008 *CSO Control Plan Update* (King County, 2008) provides required updates to the 2000 *CSO Control Plan*. An Ecology CSO regulation (WAC 173-245) requires that updates coincide with each NPDES permit renewal for the West Point Treatment Plant. Updates are intended to document progress on implementing the county's previous CSO control program, identify the plan for the next five years, and provide a vehicle for making changes in the overall long-term program.

2.3 CURRENT PROJECT

2.3.1 Project Priority and Timeline

The Barton and Murray CSO Control Projects are among four Priority 1 projects identified by the 2008 CSO control program update and RWSP annual report. Predesign on these four projects, collectively called the Puget Sound Beach Projects, began in 2008 (the other two projects included are in South Magnolia and North Beach). Construction is expected to begin in late 2013.

2.3.2 Planning Period

The Barton and Murray CSO control project planning is based on the requirements of the 2008 CSO Control Program update. Proposed facilities described in this report have been evaluated based on a construction start date in 2013 and a project life of 50 years. CSO control volumes to meet the CSO control requirements have been determined in this report based on computer modeling that was calibrated to historical flow monitoring by King County as of December 2009. The control volume is the volume of wastewater flow for which storage, conveyance or diversion capacity must be provided in order to achieve CSO goals.

2.4 FACILITY PLAN REQUIREMENTS

The Barton and Murray CSO Control Project Facility Plan was prepared by Tetra Tech, Inc. and Carollo Engineers under Contract E00022E06 with the Wastewater Treatment Division of the King County Department of Natural Resources and Parks. It was developed to meet Washington requirements for wastewater engineering reports (Washington Administrative Code (WAC) 173-240-060) as well as facility plan requirements defined in Washington's August 2008 *Criteria for Sewage Works Design* ("The Orange Book" Section C3), and Code of Federal Regulations Title 40 Part 35 (40 CFR 35, Section 35.917-1). The requirements of these two documents are presented in Table 2.1, along with the chapter in which each requirement is addressed in this facilities plan.

Table 2.1 Facility Plan Requirements	
WAC 173-240-060 Requirement	Location Addressed
<ul style="list-style-type: none"> • The name, address, and telephone number of the owner of the proposed facilities, and the owner’s authorized representative. 	Chapter 2
<ul style="list-style-type: none"> • A project description that includes a location map and a map of the present and proposed service area. 	Chapter 2
<ul style="list-style-type: none"> • A statement of the present and expected future quantity and quality of wastewater, including any industrial wastes that may be present or expected in the sewer system. 	Chapter 4
<ul style="list-style-type: none"> • The degree of treatment required based upon applicable permits and rules, the receiving body of water, the amount and strength of wastewater to be treated, and other influencing factors. 	Chapters 2 and 4
<ul style="list-style-type: none"> • A description of the receiving water, applicable water quality standards, and how water quality standards will be met outside any applicable dilution zone. 	Chapters 2, 3, and 4
<ul style="list-style-type: none"> • The type of treatment process proposed, based upon the character of the wastewater to be handled, the method of disposal, the degree of treatment required, and a discussion of the alternatives evaluated and the reasons they are unacceptable. 	Chapters 4 – 8
<ul style="list-style-type: none"> • The basic design data and sizing calculations of each unit of the treatment works, expected efficiencies of each unit and of the entire plant, and anticipated effluent character. 	Chapters 4 – 8
<ul style="list-style-type: none"> • Discussion of the various sites available and the advantages and disadvantages of the site or sites recommended. The proximity of residences or developed areas to any treatment plant site and the various plant units. 	Chapter 5 – 7
<ul style="list-style-type: none"> • A flow diagram that shows general layout of the various units, the location of the effluent discharge, and a hydraulic profile of the system that is the subject of the facility plan and any hydraulic related portions. 	Chapter 8
<ul style="list-style-type: none"> • A discussion of infiltration and inflow problems, overflows and bypasses, and proposed corrections and controls. 	Chapters 4 – 7
<ul style="list-style-type: none"> • A discussion of any special provisions for treating industrial wastes, including any pretreatment requirements for significant industrial sources. 	Not Applicable

Table 2.1 Facility Plan Requirements	
WAC 173-240-060 Requirement	Location Addressed
<ul style="list-style-type: none"> • Detailed outfall analysis or other disposal method selected. 	Not Applicable
<ul style="list-style-type: none"> • A discussion of the method of final sludge disposal and any alternatives considered. 	Not Applicable
<ul style="list-style-type: none"> • Provisions for future needs. 	Chapter 8
<ul style="list-style-type: none"> • Staffing and testing requirements for the facilities. 	Chapter 8
<ul style="list-style-type: none"> • An estimate of the cost and expenses of the proposed facility and the method of assessing these costs and expenses. The total amount shall include both capital and operations and maintenance costs for the life of the project, and must be presented in terms of the total annual cost and present worth. 	Chapter 9
<ul style="list-style-type: none"> • A statement regarding compliance with any applicable state or local water quality management plan or any plan adopted under the Federal Water Pollution Control Act as amended. 	Chapter 11
<ul style="list-style-type: none"> • A statement regarding compliance with the State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA), if applicable. 	Chapters 8 and 11
Orange Book Requirement	Location Addressed
<ul style="list-style-type: none"> • Well documented site description, problem identification, and map. 	Chapter 2
<ul style="list-style-type: none"> • Well documented description of discharge standards. 	Chapter 2
<ul style="list-style-type: none"> • Background information including: <ul style="list-style-type: none"> – Existing environment (water, air, sensitive areas, flood plains, shore lands, wetlands, endangered species/habitats, public health, prime or unique farmland, archaeological and historical sites, any federally recognized “wild and scenic rivers,” threatened species). 	Chapters 3 and 6
<ul style="list-style-type: none"> <ul style="list-style-type: none"> – Demographic and land use (current population, present wastewater treatment, advanced-treatment need evaluated, infiltration and inflow [I/I] studies, CSOs, sanitary surveys for unsewered areas, determination that I/I is not excessive). 	Chapters 3 and 4

Table 2.1 Facility Plan Requirements	
Orange Book Requirement	Location Addressed
<ul style="list-style-type: none"> • Future conditions, including appropriateness of population data source, zoning changes, future domestic and industrial flows, and flow reduction options, future flows and loading, reserved capacity, future environment without project, discussion of whether recreation and open space alternatives could be incorporated. 	Chapter 4
<ul style="list-style-type: none"> • Alternatives: list of specific alternative categories, including no action, collection system alternatives, sludge management/use alternatives, flow reduction, costs, environmental impacts, public acceptability, rank order, recommended alternative, description of innovative and alternative technologies. 	Chapter 5 – 7
<ul style="list-style-type: none"> • Final recommended alternative: site layout, flow diagram, sizing, environmental impacts, design life, sludge management, ability to expand, operation and maintenance/staffing needs, design parameters, feasibility of implementation. 	Chapter 8
<ul style="list-style-type: none"> • Financial Analysis: costs, user charges, financial capability, capital financing plan, implementation plan. 	Chapters 9 and 10
<ul style="list-style-type: none"> • Other: <ul style="list-style-type: none"> – Conformance to water quality management plan. 	Chapter 11
<ul style="list-style-type: none"> – State Environmental Policy Act approval, list required permits, environmental issues analysis. 	Chapters 8, 10 and 11
<ul style="list-style-type: none"> – State Environmental Review Process compliance. 	Chapter 11
<ul style="list-style-type: none"> – Documentation that the project is identified in a sewer general plan. 	Chapters 2 and 11
<ul style="list-style-type: none"> – Capital improvement plan. 	Chapter 9
<ul style="list-style-type: none"> – Documentation of adequate public involvement process. 	Chapter 11

2.5 CONTACT INFORMATION

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