

**NOTE: This impact assessment is based on Service Strategy 4 as presented in the Draft RWSP. See Part I of this FEIS for revised strategy descriptions and analysis.**

---

## CHAPTER 8

# IMPACTS AND MITIGATION MEASURES FOR SERVICE STRATEGY 4

Service Strategy 4 is described in Chapter 3 of this EIS. The major features of SS4 are summarized as follows:

- Maintain the existing two-treatment-plant system (West and East Plants)
- Expand West Plant to planned capacity of 159 mgd (2010)
- Expand East Plant in increments to an ultimate capacity of 235 mgd (2040)
- Construct 18-mile-long deep tunnel for CSOs and wastewater
- Implement CSO program to achieve one event per outfall per year by 2043.
- Implement full-scale I/I reduction program

The important features of Service Strategy 4 are shown in the Figure 3-4.

## WATER RESOURCES

### Impacts

Treatment plant discharges would increase under SS4 as a direct result of expected population growth in the region. Increased discharges would cause operational impacts on water quality in Puget Sound off Duwamish Head and West Point. Pollutant loading rates for SS4 are expected to increase in Puget Sound similar to SS1, SS2, and SS3. Based on their depth and relative locations in Puget Sound, slower flushing rates occur at the East Plant outfall off Duwamish Head compared to the West Point and potential North Treatment Plant outfalls. In general, the greater an outfall's depth in the water column, the longer it takes for the effluent to be flushed north out of Puget Sound (Ebbesmeyer 1994). Thus, this service strategy would result in relatively higher water quality impacts, similar to SS1.

### ***West Service Area Treatment and Conveyance***

Operations impacts for the West Plant would be that same as those identified previously for SS1 and SS2. Impacts arising from the operation of conveyance systems that would serve the West Service area would be similar to those described for the other service strategies.

### ***East Service Area Treatment and Conveyance***

Expansion of the East Plant to 235 mgd under SS4 would result in operational impacts similar to those described for SS1.

### ***North Service Area Treatment and Conveyance***

No North Treatment Plant would be constructed under this service strategy.

### ***CSOs***

CSO discharges for SS4 would result in an improvement in water quality over existing conditions. Pollutant loading to receiving waters would be reduced for all contaminants of concern, with the same types of impacts as SS1, SS2, and SS3.

CSO outfall sites that would be improved include discharges to the Duwamish River (i.e., Michigan St., Brandon St., and the Duwamish regulator), Elliott Bay (i.e., Denny Way, and Lander St., and Hanford #2), the Ship Canal (University/Montlake, Canal St., and 3rd Ave. W), and Salmon Bay (i.e., 11th Avenue W. and Ballard).

SS4 would result in the greatest control of CSO pollutants of all service strategies for the Duwamish River and Elliott Bay because, instead of providing primary treatment and continued nearshore discharge of these CSOs as the other service strategies would, it would route these CSO flows through either the West or East Treatment Plants. As a result, the flows would receive secondary treatment (except during high flow conditions, when some flows would receive primary treatment) and would be discharged through an offshore marine outfall.

### ***Infiltration/Inflow***

An aggressive I/I reduction effort would be included for SS4. A 30 percent reduction in infiltration and inflow for all basins of the service area would result in impacts similar to those described for SS1.

### ***Mitigation Measures***

The mitigation measures suitable for water resources in SS4 are similar to those previously identified for SS1.

## **BIOLOGICAL RESOURCES**

### **Impacts**

Biological resource impacts under SS4 would be similar to those discussed for SS1. New outfalls would not be constructed off Duwamish Head or for a North Treatment Plant, but discharges and associated adverse biological resource impacts would occur at the existing outfalls at Duwamish Head and West Point. There would be no new parallel

Kenmore Interceptor. As a result, potential impacts to biological resources associated with Lake Washington would not occur. Impacts from all other facilities would be the same as those for SS1.

Operation of the proposed tunnel from Kenmore to Duwamish would not have any biological resource impacts. This tunnel would be located well underground, would not disturb any wildlife habitat, and is unlikely to rupture, releasing wastewater that could migrate to surface waters.

Long-term positive impacts to water quality would be greater than under SS1, because most flows would be routed to the tunnel to undergo secondary treatment at the West or East Plants instead of being discharged at CSO outfalls. The Kenmore to Duwamish tunnel would be constructed to achieve a “once-per-year” CSO untreated discharge event standard over the long term. This untreated discharge event could result in localized, temporary impacts to fish and shellfish resources.

### **Mitigation Measures**

Mitigation would be the same as identified for SS1.

### **Unavoidable Adverse Impacts**

Unavoidable adverse impacts would be the same as those identified for SS1.

## **LAND AND SHORELINE USE**

### **Consistency with Policies and Regulations**

#### ***Growth Management Act and Local Comprehensive Plans***

Impacts under SS4 are similar to those described for SS1.

#### ***Shoreline Management Act***

For Service Strategy 4, demonstration of benefit and need would be required for expansion of the West Plant (see discussion of West Plant land use permit process and Settlement Agreement in Chapter 5 under Impacts Specific to SS1). A number of CSO facilities are proposed for designated shoreline areas, and they would require shoreline permits, however CSO treatment facilities would not be constructed along the Duwamish Waterway and the Elliott Bay shoreline.

#### ***Zoning***

Zoning issues at the West and East Plant sites would be similar to those discussed for SS1, because plant expansions would achieve the same capacities. The proposed tunnel and associated portals would be considered utilities under local zoning regulations.

Utilities are allowed in most zones, either as permitted uses or as uses requiring conditional or special use permits. A public hearing may be required before the local jurisdiction grants a conditional or special use permit.

## **Direct Land Use Impacts**

### ***West Service Area Treatment and Conveyance***

Impacts from expansion of the West Plant to 159 mgd would be similar to those described for SS1 and SS2.

Because of concerns about odors, noise, and visual character, pumping stations may be perceived by nearby residents and businesses as incompatible with surrounding land uses.

Operation of the proposed tunnel would result in few land use impacts. The tunnel itself would be buried deeply underground and would not be visible or otherwise detectable at the surface. Tunnel portals would be contained within a small building at most two stories in height that would be similar in scale or smaller than typical buildings in surrounding areas. During tunnel operation, little activity would typically occur in the vicinity of the portals. They would be relatively unobtrusive land uses in most locations.

### ***East Service Area Treatment and Conveyance***

The expanded East Plant would be located in a highly urbanized industrial/commercial area, and with continuation of the existing site design features and extension of perimeter buffering, the expanded plant would be compatible with surrounding land uses.

### ***CSO and Infiltration/Inflow***

I/I control impacts would be similar to those of SS1. Impacts of CSO control facilities would be less because there would be fewer individual storage and treatment facilities.

## **Mitigation Measures**

Mitigation measures would be similar to those described for SS1.

## **Unavoidable Adverse Impacts**

Expansion of the capacity of the West Treatment Plant within the existing plant boundary may be perceived by some as incompatible with surrounding recreational uses.

## **ENVIRONMENTAL HEALTH**

### **Public Health**

#### ***Impacts***

Over the long term, environmental health benefits of reductions in CSO volumes and the frequency of CSO events would be better than the other three service strategies because there would be less CSO discharged to waterways.

#### ***Mitigation Measures***

No mitigation measures are required.

#### ***Unavoidable Adverse Impacts***

No unavoidable adverse impacts are anticipated.

### **Noise**

#### ***Impacts***

Noise impacts associated with treatment plants would be the same as SS1.

#### ***Mitigation Measures***

Mitigation would be the same as for SS1.

#### ***Unavoidable Adverse Impacts***

No unavoidable adverse impacts are anticipated.

### **Hazardous Materials**

#### ***Impacts***

Hazardous materials impacts would be similar to SS1, except that SS4 does not include small CSO treatment plants, which would have disinfection chemicals stored onsite.

#### ***Mitigation Measures***

Mitigation would be the same as for SS1.

#### ***Unavoidable Adverse Impacts***

No unavoidable adverse impacts are anticipated.

## **OTHER ELEMENTS OF THE ENVIRONMENT**

### **Earth Resources**

#### ***Impacts***

Operational impacts on earth resources under SS4 would be similar to those discussed for SS1. Discharges from CSOs would be reduced further under this strategy, with greater benefit to sediments. Construction impacts associated with the deep tunnel are discussed in Chapter 11.

#### ***Mitigation Measures***

Mitigation measures would be the same in character as those identified for SS1. There would be fewer aboveground facilities (no CSO control facilities along Duwamish River and Elliott Bay).

#### ***Unavoidable Adverse Impacts***

No unavoidable adverse impacts are anticipated.

### **Aesthetics**

#### ***Impacts***

Impacts to aesthetics are the same in character as identified for SS1. There would be fewer aboveground facilities (no CSO control facilities along Duwamish River and Elliott Bay).

#### ***Mitigation Measures***

Mitigation measures are the same as identified for SS1.

#### ***Unavoidable Adverse Impacts***

Unavoidable Adverse Impacts are the same as described for SS1.

### **Recreation**

#### ***Impacts***

Impacts to recreation are the same as identified for SS1, with the exceptions that impacts under SS1 related to the Kenmore interceptor parallel and the associated pump station in Matthews Beach Park would not occur under SS4.

#### ***Mitigation Measures***

No significant post-construction adverse impacts to recreation are expected, and no mitigation measures would be necessary.

## ***Unavoidable Adverse Impacts***

No unavoidable adverse impacts are anticipated.

## **Cultural Resources**

No cultural resource impacts would result from operation of SS4. Construction impacts are discussed in Chapter 11.

## **Air Quality**

### ***Impacts***

Because volatile organic compounds are regulated as precursors to ozone, a regional pollutant, their impacts are not localized with respect to treatment facilities. For a complete discussion of VOCs, please refer to Chapter 5.

SS4 would have the same ultimate secondary treatment plant configuration as for SS1 (159 mgd at West Plant and 235 mgd at the East Plant), but expansion prior to 2010 would occur at the West Plant, as opposed to the East Plant, under SS1. Because the West Plant's high-purity oxygen treatment process has a very low odor-generation potential compared to other processes, and because of the relatively small increment of additional flow, any increases in odor levels are expected to be low. Expansions of the East Plant in 2020 and 2040 could result in higher odor impacts, because the increases would be larger in scale (39 and 81 mgd, respectively) and would likely use treatment processes with a higher potential for odor generation. Infill of the area surrounding the East Plant may also, in future years, create a higher level of sensitivity to odor impacts on the surrounding area.

Pump stations would have impacts similar to those described for SS1.

### ***Mitigation Measures***

Mitigation would be as described for SS1.

## ***Unavoidable Adverse Impacts***

Unavoidable adverse impacts would be as described for SS1.

## **Transportation**

### ***Impacts***

Operational impacts to transportation from the expansion of the West and East Plants under SS4 would be the same as those described under SS1. Please see Table 5-2 (in Chapter 5) for a summary of these impacts.

***Mitigation Measures***

Mitigation would be the same as identified for SS1.

***Unavoidable Adverse Impacts***

Unavoidable adverse impacts would be as described for SS1.

**Public Services, Utilities, and Energy**

***Impacts***

Impacts would be similar to those described for SS1.

***Mitigation Measures***

Mitigation would be as described for SS1.

***Unavoidable Adverse Impacts***

Treatment of higher wastewater volumes would result in increased energy usage.