

NOTE: This impact assessment is based on Service Strategy 2 as presented in the Draft RWSP. See Part I of this FEIS for revised strategy descriptions and analysis.

CHAPTER 6

IMPACTS AND MITIGATION MEASURES FOR SERVICE STRATEGY 2

Service Strategy 2 is described in Chapter 3 of this EIS. The major features of SS2 are summarized as follows:

- Create a three-treatment-plant system (comprised of West Plant, East Plant, and a new North Plant)
- Expand West Plant to planned capacity of 159 mgd (2010)
- Construct new parallel Kenmore Interceptor (2003)
- Expand East Plant in increments to 172 mgd (2042)
- Construct new third outfall off Duwamish Head (2010)
- Construct new 65-mgd North Plant in increments (2032)
- Construct a conveyance system to carry influent to the North Treatment Plant and an outfall from the North Treatment Plant to Puget Sound (2018)
- Implement CSO program to achieve one event per outfall per year by 2043.
- Implement small-scale I/I reduction program

The important features of Service Strategy 2 are shown in the Figure 3-2.

WATER RESOURCES

Impacts

West Service Area Treatment and Conveyance

Treatment plant discharges would increase for SS2 based on expansion of the West Plant to 159 mgd. This increased discharge of treated wastewater effluent would result in operational impacts to water quality in Puget Sound off West Point. The increase in pollutant loading to Puget Sound is expected to be similar to that noted for SS1.

East Service Area Treatment and Conveyance

Expansion of the East Plant to 172 mgd would result in the increase of treated wastewater effluent discharged to Puget Sound off of Duwamish Head. As noted for the West Plant, pollutant loading is expected to increase in Puget Sound for nutrients, metals, organic compounds, fecal coliform bacteria, and total suspended solids. As noted for SS1, because the East Plant outfall discharges into the deeper waters of Puget Sound, this effluent would tend to move southward farther into the sound. Thus, those pollutants present in the treated effluent would take somewhat longer to disperse than for effluent discharged into shallower waters of the sound (e.g., West Point outfall).

North Service Area Treatment and Conveyance

Operation of a North Plant with the capacity to treat 65 mgd would result in the discharge of wastewater effluent into Puget Sound from a new outfall off the north King County or south Snohomish County shore. Pollutant loadings would be expected to increase in Puget Sound as described for SS1. However, as described in Chapter 5, differences in flushing rates occur between the West Point, Duwamish Head, and potential North Plant outfalls based on whether they discharge to the upper or lower water layers in Puget Sound.

With discharge to the upper water layer, the North Plant outfall would be in a desirable location for flushing effluent out of Puget Sound because it would discharge to the main channel, where this layer is moving rapidly northward, out of the Sound. The strong currents in this channel would also maximize mixing and dispersion of the effluent. As noted in Chapter 3, the complexity of the flow layering in this area of the Sound will require additional study to determine the best location for the North Plant outfall.

To the extent that SS2 directed effluent away from the Duwamish Head outfall to a more northerly outfall that discharged into the upper water layer, it would be preferable from a water quality perspective to service strategies relying more heavily on treatment at the East Plant (i.e., SS1 and SS4).

CSOs

CSO discharges for SS2 would result in the same impacts as for SS1. Pollutant loading to receiving waters would be reduced for all pollutants of concern, with impacts similar to SS1.

CSO outfall sites that would be improved include discharges to the Puget Sound beaches, the East Ship Canal, the Duwamish River, and the West Ship Canal, as the CSO projects are phased over time.

Infiltration/Inflow

SS2 includes a maintenance level of I/I reduction, in contrast to the aggressive level of SS1. As a result, the reduction in infiltration and inflow for all basins of the service area would result in benefits to water resources as noted for SS1, although to a somewhat lesser degree.

Mitigation Measures

The mitigation measures for water resources identified for implementation in SS2 are similar to those identified for SS1.

Unavoidable Adverse Impacts

Increases in wastewater volumes under any of the Service Strategies would increase overall pollutant loadings in Puget Sound.

BIOLOGICAL RESOURCES

Impacts

West and East Service Area Treatment and Conveyance

Operational impacts at the West Plant would be the same as SS1. Operational impacts associated with a third outfall at Duwamish Head would be similar to SS1, but somewhat less, because the East Plant would only be expanded to 172 mgd under SS2 (compared to 235 mgd for SS1).

North Service Area Treatment and Conveyance

Additional baseline studies would be required for proper design and operation of a new North Plant outfall to identify aquatic biological resources potentially at risk from discharge. Potential impacts include both physical and chemical changes in the aquatic environment that may adversely affect biological resources, as discussed generally in Chapter 5. The outfall location at the northern edge of the service area is the most favorable for long-term impacts to Puget Sound-wide biological resources if effluent is discharged into upper water layers, because effluent would generally flow northward and out of Puget Sound more quickly than effluent from other outfalls (particularly the Duwamish Head outfall). The outfall and any associated mixing and sediment impact zones would be designed to meet all applicable water quality and sediment standards. These standards have been developed to minimize adverse impacts on beneficial uses of marine waters including fish, shellfish, eelgrass, kelp, and other marine resources, which occur in the waters of western Washington. Consequently, the North Plant discharge is not expected to result in significant adverse impacts on the biological resources of central Puget Sound.

CSOs and Infiltration/Inflow

Impacts would be the same as for SS1.

Mitigation Measures

Mitigation would be the same as for SS1.

Unavoidable Adverse Impacts

Unavoidable impacts would be the same as for SS1.

LAND AND SHORELINE USE

Consistency with Policies and Regulations

Growth Management Act and Local Comprehensive Plans

The consistency of SS2 with the GMA and local comprehensive plans would be similar to that described for SS1.

Siting of a new North Plant could potentially invoke Snohomish County's "common siting process" for essential public facilities at the county and local levels.

Consistent with the Growth Management Act (GMA) of 1990, countywide planning policies for King and Snohomish County include directives for development of a coordinated interjurisdictional approach to siting essential public facilities of a countywide or statewide nature, typically defined as difficult and controversial to site. These facilities include regional wastewater treatment plants.

Snohomish County adopted a comprehensive plan amendment that incorporates criteria for siting essential public facilities of a countywide or statewide nature in January 1996. In order for the process to be operational, two additional components require completion: (1) approval of operational guidelines for siting facilities; and (2) development of an Interlocal Agreement, to be approved by each jurisdiction within Snohomish County. Snohomish County is currently working toward completion of this process. King County has not yet begun to develop a common siting process.

Shoreline Management Act

For SS2, a number of major facilities are proposed for designated shoreline areas and would require shoreline permits. Impacts would be similar to those described for SS1.

Zoning

The zoning issues that apply to the West and East Plants were discussed under SS1, and expansion at those sites under SS2 would raise similar issues.

The zoning at the North Plant site would depend on its location. Shoreline areas in north King County and south Snohomish County typically have residential or other non-industrial/commercial zoning. Inland lowland areas north of Lake Washington, in south Snohomish County and north King County, have a mix of industrial, commercial, residential, and other zoning. Site plan review would be required for a treatment plant in any of these areas.

The numerous individual pump stations, conveyance lines, and storage facilities proposed under SS2 (usually classified as utilities) are generally permitted, either outright or by granting a special use, unclassified use, or similar land use permit. Where such a land use permit is required, landscaping or siting requirements and other performance standards are included as permit conditions to ensure compatibility with surrounding land uses.

Direct Land Use Impacts

West Service Area Treatment and Conveyance

Expansion of the West Plant and pump stations in the West Service Area would be the same as that described for SS1, and impacts would be the same.

East Service Area Treatment and Conveyance

Impacts would be similar to those described for SS1, except that the East Plant would occupy a smaller area of the site.

North Service Area Treatment and Conveyance

The compatibility of a new North Plant with adjacent land uses would depend on its location. A site of 25 to 35 acres would be required to accommodate the new plant facilities and a buffer. A North Plant could be located at a shoreline site or at an inland location. Regardless of the location chosen for a new North Plant, construction of a pipeline (either influent or effluent) from the area north of Lake Washington westward to the Puget Sound shoreline would be required. Additional facilities conveying influent to the plant would also be constructed. If SS2 (or SS3, which also includes a new North Plant) is selected, additional project-level site selection and environmental review studies would be needed before a final plant location would be determined. Criteria to screen potential sites would be developed, and a more complete review of land use compatibility, as well as other environmental and operational issues, would be undertaken.

Some general observations can be made about potential plant locations. In the general vicinity where a North Plant could be sited there are undeveloped areas designated for industrial and commercial land uses that would be more compatible with a new wastewater treatment plant. If the land was developed those industrial and commercial uses could be displaced. There are also areas of office park and other commercial development which would be potentially less compatible with wastewater treatment use and also could involve displacement if the land was already developed. Compatibility issues would be the greatest for areas in residential use.

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

CSO and Infiltration/Inflow

Impacts would be the same as for SS1.

Mitigation Measures

For development of new aboveground wastewater facilities proposed under SS2 (including a new North Plant), the site selection and design processes would include consideration of the nature of nearby land uses and natural environmental features, and give high priority to consistency with local comprehensive plans and compatibility with adjacent land uses. For example, land use consistency and compatibility would be promoted through inclusion of appropriate design features (odor and noise control, for example) coupled with an appropriate degree of perimeter buffering.

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

Proposed CSO control projects and the associated beneficial public health impacts are the same as identified in Chapter 5 under “Impacts Common to All Service Strategies.”

Mitigation Measures

No mitigation measures are required.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

Noise

Impacts

Noise impacts under SS2 would be similar in nature, but slightly reduced, for the East Plant compared to SS1, because of the smaller plant size (172 mgd compared to 235 mgd). Impacts would be the same at the West Plant. A new North Plant would be designed to minimize noise impacts to surrounding areas and would meet all applicable local noise requirements. Because no site has been identified for a North Plant, it is unknown whether truck noise would affect sensitive receptors.

Mitigation Measures

Mitigation for noise impacts would be as described for SS1.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

Hazardous Materials

Impacts

Hazardous materials impacts under SS2 would be similar to SS1 at the West and East Plant sites, but slightly less chlorine is likely to be used at the East Plant given the smaller plant capacity (172 mgd compared to 235 mgd). Chlorine would be used for

disinfection at a new North Plant. It is anticipated that chlorine would be transported to the plant by truck or rail. Similar safety measures would be developed as are in place at the East and West plants to minimize environmental health risks.

Mitigation Measures

Mitigation would be the same as identified for SS1.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

OTHER ELEMENTS OF THE ENVIRONMENT

Earth Resources

Impacts

New conveyances and CSO facilities would contribute minor amounts of additional impervious surface area. Expansion of the West Plant and the East Plant, and construction of a new 65-mgd North Plant would result in the following estimated additional impervious surface areas:

- East Treatment Plant expansion—32 to 35 acres
- West Treatment Plant expansion—1.5 acres
- North Treatment Plant—16 to 20 acres

Impacts on earth resources from proposed facilities would not be significant. A high-magnitude earthquake could result in structural damage to the East Plant, which is located in an area subject to liquefaction during seismic activity. Large earthquakes could also result in structural instability at a new North Treatment Plant, depending on final site selection.

Benefits to sediment quality from increased CSO control would be the same as described for SS1.

Mitigation Measures

Mitigation measures would be similar to those described for SS1.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

Aesthetics

Impacts

Additional facilities at the West Plant under SS2 would be located within existing plant boundaries. Additional structures, which would be lower than most of the existing plant buildings, would result in an overall facility that is only slightly more visible than the existing facility. Expansion of the East Treatment Plant would result in approximately a 50 percent increase in the size of the existing treatment plant. Although the expanded plant would be similar in scale and visual character to the surrounding industrial and office development, its expanded size would make the facility more visible from nearby viewpoints and distant valley residences.

If a new North Treatment Plant were to be located at a shoreline location, adverse visual impacts of the facility could be significant. A new treatment plant would be a major visual element in an otherwise nonindustrial area on most shoreline sites. The visual impacts of a treatment plant at a lowland inland site north of Lake Washington would depend on site location. Most potential locations in this area are highly visible, and a treatment plant would be a new visual element in the landscape.

No adverse aesthetic impacts would result from operation of underground facilities (i.e., conveyances and tunnels).

Pump stations are small structures similar to or smaller in scale than nearby residential, commercial, or industrial structures. They typically consist of several thousand square feet or less and are one to two stories high. Their utilitarian character and specialized odor equipment can make pump stations visually prominent. However, because they are small, these facilities are usually seen only from nearby locations, so visual impacts are not likely to be significant.

Mitigation Measures

Existing berming, landscaping, and other visual mitigation measures at the West Plant should be sufficient to mitigate any adverse aesthetic impacts of an expanded facility. To mitigate adverse visual impacts resulting from an expanded East Plant, the extensive mitigation measures employed at the existing treatment plant should be expanded to include the new structures. These mitigation measures include perimeter berming, perimeter and interior landscaping, and siting of facilities to direct views into the site toward open areas and away from structures. Measures to mitigate adverse visual impacts from a North Plant would be similar to measures described for the East Plant.

For pump stations located at visible sites from nearby properties, landscaping could be provided to obscure the visibility of the facility.

Unavoidable Adverse Impacts

Construction of a new North Treatment Plant would change the visual character of the immediately surrounding area to some degree.

Recreation

Impacts

The addition of 26 mgd of capacity to the West Plant under SS2 would not result in new wastewater facilities outside plant boundaries. However, one area of the plant reserved for future facilities is currently available for recreational use and that would be taken for the expanded plant. Expansion of the East Plant would not result in the loss of any land used for recreation. A location for a new North Plant that avoided displacing existing recreational facilities would be sought. Consequently, the plant would be unlikely to result in the loss of recreational facilities. Adverse post-construction impacts on recreation resulting from North Plant expansion or construction would be minimal.

Underground facilities (conveyances and tunnels) would not result in any post-construction adverse impacts on recreation.

Expansion of the Matthews Beach pump stations in conjunction with construction of the Kenmore interceptor parallel may result in the loss of minor areas in Matthews Beach Park. The Murray Avenue CSO control project could eliminate some recreational space at Lowman Beach Park.

Implementation of the I/I program would probably not result in any recreation impacts.

Mitigation Measures

No significant 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 SS2. Potential construction impacts are discussed in Chapter 11.

Air Quality

Impacts

Because VOCs are regulated as precursors to ozone, which is a regional pollutant, their impacts are not localized with respect to treatment facilities. A full discussion of VOCs is provided in Chapter 5.

Siting of a North Plant would play a large role in determining the probable extent of odor impacts and the appropriate mitigation. Predominant wind conditions are a determining factor in how severely odor impacts are experienced. However, if a new treatment plant were sited with potential to adversely affect a sensitive neighborhood, the plant would be

designed with state-of-the-art odor control technology, to enclose the more odorous processes and remove odorous compounds from the air exiting those enclosures.

This service strategy would also expand the East Plant from 115 to 172 mgd. This expansion could result in some increase in odor emissions, though the potential significance would be less than for SS1 because of the lower ultimate flow volumes.

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

Mitigation Measures

Mitigation measures would be as described for SS1.

Unavoidable Adverse Impacts

Unavoidable adverse impacts would be as described for SS1.

Transportation

Impacts

Operational impacts under SS2 are generally similar to SS1. A new North Plant would generate some additional traffic in a new location; however, the number of trips would be comparatively small. Biosolids truck trips are estimated at an average of six per day at 65-mgd capacity. Fewer trips would be generated by the proposed expansion of the East Plant to 172 mgd (compared to 235 mgd under SS1). Trips that would be generated by a new North Plant and the expanded East and West Plants are shown in Table 6-1.

Depending upon the site selected for a new North Plant, roads to the site might require improvements in order to accommodate plant traffic.

Mitigation Measures

Mitigation would be the same as identified under SS1.

Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as identified under SS1.

NOTE: Table EP2-6, Chapter EP-2, provides operational trips for revised Service Strategy 2.

Table 6-1 Operational Trips (1) Service Strategy 2							
Vehicle Type	Facility						
	West Plant		East Plant			North Plant	
	Existing, (133 mgd)	(159 mgd)	Existing, (115 mgd)	(154 mgd)	(172 mgd)	(35 mgd)	(65 mgd)
Septage Trucks	-----	-----	60/day	85/day	90/day	NA	NA
Screen/Grit Trucks	12/week	15/week	8/week	11/week	12/week	2/week	5/week
Process Chemicals	40-50/month	50-60/month	0-10/month	0-14/month	0-15/month	NA	NA
County Trucks and Cars	8/day	10/day	60/day	85/day	90/day	NA	NA
<u>Employees</u>							
Shift Crew	80/day	100/day	70/day	100/day	105/day	20/day	40/day
All Others (Mon. - Fri.)	160/day	190/day	200/day	280/day	300/day	60/day	115/day
Visitors	50/month	60/month	NA ⁽³⁾	NA	NA	NA	NA
Biosolids Trucks ⁽²⁾ (7 days a week)	14/day (7 loads)	Maximum of (13 loads)	10/day (5 loads)	14/day (7 loads)	15/day (7.5 loads)	3/day (1.5 loads)	6/day (3 loads)
<u>Chlorine</u> Railroad Cars	-----	-----	7/year	10/year	11/year	NA	NA
<p>Notes: (1) Trips are one-way; figures are rounded. "One-way" is defined as a single direction trip to a single destination. (2) Biosolids truck trips are one-way. Final conditions to the Shoreline Substantial Development Permit for upgrade to secondary treatment at West Point state that "the number of loaded sludge trucks shall not exceed 13 per day on average over a year period (January through December)." Thirteen truck loads per day equals 26 one-way truck trips as defined in Note (1). (3) Data not available.</p>							

Public Services, Utilities, and Energy

Impacts

The additional electrical energy required to operate treatment plants in the year 2030 is estimated at 32.4 million kWh per year. The amount of energy produced to offset this demand has not been estimated.

Mitigation Measures

Mitigation measures would be as described for SS1.

Unavoidable Adverse Impacts

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

Mitigation Measures

Local utilities attempt to meet the demands of their customers. Subsequent, more-detailed, environmental reviews of individual projects proposed as a result of this planning process would include assessments of possible impacts to services and utilities and any appropriate mitigation measures.