5. Wastewater Treatment Plant

5.1. Background

The original City of Gig Harbor's wastewater treatment plant was brought online to provide secondary treatment of municipal sewage in 1975. The original wastewater treatment plant had a design capacity of 0.45 million gallons per day (MGD) with an average organic loading of 700 lbs BOD_5/day. In 1988, the wastewater treatment plant (WWTP) was expanded to treat 0.7 MGD and an average organic loading of 1,800 lbs BOD_5/day. The WWTP was expanded again in 1996 to its current capacity of 1.6 MGD and an average organic loading of 3,400 lbs BOD_5/day. In 2009, the City is constructing additional improvements to the WWTP to expand capacity.

The WWTP consists of the following major components: influent flow meter, degritter, influent screens, screenings press, aeration basins, blowers, secondary clarifiers, return activated sludge pumps, waste activated sludge pump, screw press, autothermal thermophilic aerobic digester, digested sludge pumps, sludge dewatering centrifuge, chlorinators, chlorine contact tanks, dechlorination system, effluent discharge pumps, and an effluent flowmeter. Effluent from the WWTP is piped through an outfall that discharges into Gig Harbor. To reduce the impact to receiving water quality, the City plans to replace and extend the outfall to discharge into Puget Sound.

5.2. Existing Facilities Evaluation

The City of Gig Harbor "WWTP Improvements- Engineering Report" by H.R. Esvelt Engineering revised June 2003 addresses the major operation, maintenance, and capacity problems at the WWTP, which include odor and noise complaints. The Engineering Report also includes detailed descriptions and analysis of the hydraulic and operational problem areas within the WWTP, recommended WWTP improvements, estimated capital project costs, and an implementation schedule of improvements. The suggested priorities of implementation of WWTP improvement recommendations include the following areas:

- Odor and noise sources
- Operational problems that will impact effluent quality
- Processes with high operation and maintenance costs
- Problems that result in high operation and maintenance requirements
- Processes that consume higher than necessary electrical energy
- Processes with need to upgrade to meet future capacity

5.3. WWTP Improvements

Several phases have been planned for the WWTP 20-year upgrade/expansion plan and the WWTP Improvements identified in the 2003 Engineering Report have been planned to be constructed in two phases. Phase I Improvements are proposed to expand the WWTP in order to achieve existing NPDES Permit flow and loading limits. Phase I Improvements are scheduled

for construction in 2009, with Final Completion scheduled for October 2010. Phase II Improvements are proposed to expand the WWTP in order to serve the City growth within a 20-year planning horizon and include outfall improvements to increase discharge capacity and extend the outfall outside Gig Harbor to Colvos Passage. Phase II Improvements are scheduled to commence construction in 2011 with Final Completion scheduled for 2012.

5.3.1. Phase I Improvements

Phase I Improvements were refined and described in the August 2007 "Phase I Wastewater Treatment Plant Improvements Technical Memorandum" report by Cosmopolitan Engineering Group and H.R. Esvelt Engineering.

While the WWTP has been operated to meet permit limits, flows to the WWTP are very near capacities for maximum month and peak day flows. Thus, Phase I Improvements are necessary to increase the flow and waste loading capacities of the WWTP to the currently permitted flow and loading capacities of:

- 1.2 MGD annual average flow/1.6 MGD maximum monthly average flow
- 3,680 lbs/day BOD_5 and 3,680 lbs/day TSS maximum monthly average waste loads.

The updates made to the 2003 Engineering Report involve adding facilities to further enhance operational flexibility and improve effluent quality.

Prior to construction of the Phase I Improvements, a temporary sodium hypochlorite system was implemented for disinfection to eliminate the use of chlorine gas. This temporary system will be replaced with an ultraviolet (UV) disinfection system as part of the Phase II Improvements, as described below.

5.3.2. Phase II Improvements

Phase II Improvements have been refined and described in the February 2009 Draft "Engineering Report- WWTP Phase II Improvements" report. Most of the Phase II improvements recommended in this report continue the recommended treatment process improvements to be implemented in Phase I. Additionally, an evaluation of the potential impact on commercial geoduck harvest areas adjacent to the proposed extension of the existing outfall to Colvos Passage has been performed and evaluated in the 2009 Engineering Report. Also included in the report is an evaluation of water quality standards and the potential impact of treated wastewater discharge, a Biosolids Management Plan, and estimated capital costs for the recommended improvements.

Design flows for Phase II WWTP Improvements for maximum day and peak hour conditions exceed the Year 2025 flow projections presented in this Wastewater Comprehensive Plan Update. Thus, the Phase II design criteria will exceed the 20-year planning horizon flow and waste load projections.