PROJECT OF THE YEAR:
ENVIRONMENT $10-$100 MILLION

Duvall Wastewater Treatment Plant

Managing Agency: City of Duvall, Washington
Primary Contractor: IMCO General Construction, Inc.
Primary Consultant: Parametrix
Nominated By: APWA Washington Chapter

The City of Duvall was facing legal challenges to a self-imposed sewer moratorium instituted in response to rapid population growth coupled with limited treatment capacity at its existing oxidation ditch treatment plant. Also, effluent discharge from the treatment plan frequently exceeded permit limits, prompting the Washington State Department of Ecology (Ecology) to issue a compliance order requiring the City to construct a new outfall within the Snoqualmie River. The City's goals for the Wastewater Treatment Plant (WWTP) Upgrade and Outfall Replacement project were to address these two immediate concerns as well as provide a source of reclaimed water for future use.

In order to bring the effluent discharge into compliance more quickly and to facilitate a quicker permitting process, the new outfall was completed in advance of the WWTP. The outfall allows for two individual acute mixing zones within a larger chronic mixing zone, which increased model-predicted mixing by a factor of up to 20 times as compared to the old side bank outfall. With Ecology's guidance, the wet and dry weather compliance seasons were redefined to more accurately reflect river flows. The City also began collecting effluent data using clean sampling techniques to better characterize trace metal concentrations. Using these strategies, the City was able to demonstrate to Ecology that the WWTP effluent no longer had the potential to degrade the water quality and characteristics uses of the Snoqualmie River.

Part of the WWTP construction included installation of site drainage adjacent to wetlands. This was monitored closely during installation of the pipes. Construction sequencing of the new facilities was carefully planned and included in the contract to ensure existing treatment facilities remained operable. Weekly, the contractor was required to clean filter socks installed in the existing catch basins so slit would not be discharged into the river. Also, the concrete trucks wash down area was within a lined basin which was cleaned and maintained regularly.

Although the WWTP had been upgraded in 1992, the treatment system was designed only to provide typical secondary treatment (using oxidation ditch technology). This treatment technology was sufficient to meet discharge permit limits; however, the City desired a treatment process that would meet current limits and

potentially more strict limits imposed in the future, as well as provide an alternative to completely eliminate the river discharge. The City's consultant proposed in the future, as well as provides an alternative to completely eliminate the river discharge. The City's consultant proposed using a membrane bioreactor (MBR) process with nitrification/denitrification, which met existing and potential future discharge requirements while also meeting site size constraints, addressed City concerns regarding limited WWTP operator availability and provided a future source of Class A reclaimed water.