PROJECT PROFILE

An Affordable Wastewater Collection and Treatment Solution for Municipalities and Communities

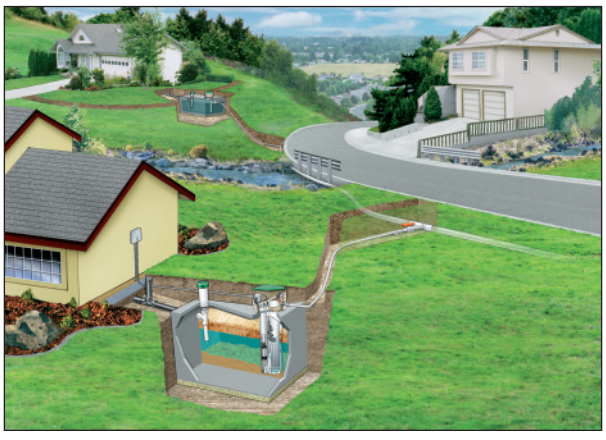
YELM, WASHINGTON

Problem In the early 1990's the fast-growing town of Yelm, Washington was served by outdated septic systems and lacked the wastewater infrastructure to support development. Yelm needed to build a sewer system without burdening residents with high rates or the cost of future growth. Consequently, a phased system with low maintenance costs and low repair/replacement costs was crucial.

Solution The city of Yelm installed a modular, expandable Orenco Effluent Sewer System in 1994. With 67% growth throughout the 1990s, Yelm now has 1,700 connections. Yet maintenance costs (e.g., tank pumping) and repair/replacement costs (e.g., on-lot pumps) have remained low, resulting in low life-cycle costs and affordable sewer rates.

Low Life Cycle Costs Keep Rates Low

In the early 1990's, the small town of Yelm, Washington needed to replace outdated septic systems with a sewer system. The city's population was spread over a large area, and it anticipated its service area would quickly double. How could it build a wastewater collection system capable of accommodating growth? Sizing a conventional gravity sewer with 100% more capacity for future development would unfairly burden existing users by imposing unaffordable rates until new development occurred.



Effluent sewers are an affordable, phase-able sewer option that doesn't burden current residents with high rates for future system growth.

To solve this problem, Yelm chose to install an Orenco Effluent Sewer, saving the community hundreds of thousands of dollars in capital costs compared with the cost of a gravity system and giving them the ability to defer a large portion of collection system costs until growth actually occurred.

The low-pressure mains of an effluent sewer are small and shallowly buried (as water lines are), so the city was easily able to oversize them throughout the service area.

Municipal and Community Market

Project Overview

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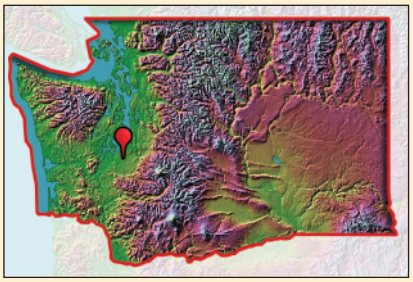

Design Parameters
- 5,800 people
- 1,700 STEP connections (residential and commercial)
- 2.7 people/home (average)

Installation Date
- 1994

Rate Structure
- $43.16/month/residence

Collection System
- 1,000-, 1,200-, and 1,500-gallon two compartment, precast concrete interceptor tanks
- Biotube® STEP packages with ½-hp, 115-V high-head effluent pumps
- Small-diameter low-pressure sewer mains

Secondary Treatment
- Sequencing Batch Reactor (SBR)
- Discharge to surface waters under NPDES permit

Tank Pump-out
- $0.24 per gallon, tipping fee included
- ~6-year pump-out frequency
- $2.96/mo/residence

Pump Repair & Replacement
- 1,700+ pumps
- 28 replaced since initial installations in 1994

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YELM, WASHINGTON

Capital costs were a fraction of what it would have cost to oversize conventional gravity sewer mains and lift stations. In addition, since the majority of the costs for Orenco Effluent Sewers are for each property's on-lot equipment – the underground septic tank and its STEP (Septic Tank Effluent Pumping) system — the city was able to defer upwards of 75% of the future collection system costs until property development occurred.

Because the city wanted to keep sewer rates as low as possible, life-cycle and operating costs were a critical factor in the city's technology selection process. With some technologies, life-cycle costs contribute a large portion, often the majority, of the users' rate structure.

Like other small communities, Yelm was initially concerned about two O&M cost categories: the cost of periodically pumping and hauling solids from septic tanks, and the cost of replacing the system's in-tank pumps. Yelm's experience has shown these costs are not often incurred and are therefore very low, amortized on a per-month basis.

For example, the NPDES permit requires each on-lot system to be inspected every three years. Sludge and scum levels in the tank are measured and recorded, the pump is inspected, and the effluent screen is cleaned. Most residential units have 1,000-gallon tanks, which are pumped out every 6 years on average, at a cost of $0.24 per gallon. Amortized at 4% interest, this comes to about $2.96 per month per residence to manage sludge.

To minimize the cost of replacing pumps, Yelm selected an Orenco Biotube® STEP package for each tank, which includes an Orenco high-head effluent pump. The system was commissioned in 1994, and more than 1,700 STEP systems have been installed. Yet only 28 pumps have been replaced in the interim. Since the pumps are estimated to last 20 years, and pump replacement only costs $600 (including labor and materials), the monthly cost of each household's pump, amortized without interest, is only $1.62.

As a result of these low operation and maintenance costs, Yelm's residents pay only $43.16 in monthly sewer rates.

One important side note: When the town's system was designed, Yelm's consulting engineering firm, Skillings Connolly, designed into the system an 8-acre wetland park for wastewater reuse and aquifer recharge. This was the first Class A Water Reclamation Facility ever constructed in the state of Washington, and Yelms' treated effluent has since been used in fire hydrants and to irrigate schools, parks, and homes.

Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of October, 2009.

Municipal and Community Market

Yelm's treated wastewater is used in an 8-acre (3.2-ha) wetland park.

For more information about Orenco Effluent Sewers and AdvanTex® Treatment Systems, contact Orenco Systems®, Inc., at 800-348-9843.

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