

PROJECT PROFILE

An Affordable Wastewater Collection and Treatment Solution for Municipalities and Communities

GRIZZLY RANCH, PORTOLA, CALIFORNIA

Problem A deluxe community in California's Sierra Nevada Mountains was having problems with both the collection and treatment of its wastewater. On-lot grinder pumps at each household had a high rate of failure and typically cost about \$3000 each to replace.¹

Not only that, but the sequencing batch reactor (SBR) for wastewater treatment had never even been turned on, due to low flows. It required a minimum of 10,000 gallons per day (38 m³/day) to operate, but because of slow buildout and many seasonal residents, the community never reached that minimum threshold. Instead, it was paying a high price to have its wastewater trucked elsewhere for treatment.

Solution Grizzly Ranch began replacing failed grinder pumps with liquid-only systems, which use low-horsepower pumps that last up to 25 years.² And the SBR was replaced by an AdvanTex® AX-Max™ Wastewater Treatment System. AdvanTex systems can be installed in phases to accommodate both the low flows that are common in the early stages of a development and, later, the increased flows at full buildout. The AdvanTex system can operate year-round, even through the winter, and was available for immediate operation after being installed.

Failing Grinder Pumps, Non-Operational Treatment Plant



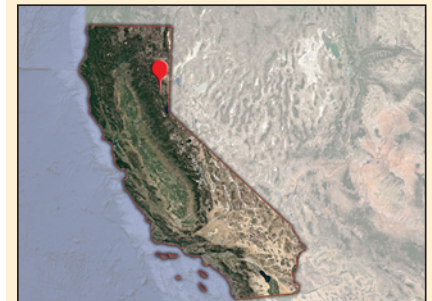
Wastewater problems at Grizzly Ranch included failing grinder pumps and a treatment system that was unable to handle the low flows that are common in the winter. (Photo courtesy of Pace Supply.)

Grizzly Ranch is a deluxe planned community in the Sierra Nevada mountains north of Lake Tahoe. Billed as a “true mountain getaway,” it boasts 292 developed homesites on 1,040 acres (420 ha). The development was designed to use a grinder wastewater collection

Municipal and Community Market

Project Overview

PORTOLA, CA



Design Parameters

- Total connections: 49 residential, 10 commercial
- Summer flows: 5,000 gpd (19 m³/day) average, 8,000 gpd (30 m³/day) maximum
- Winter flows: 2,000 gpd (7 m³/day) average, 4,000 gpd (15 m³/day) maximum
- Phase 1 capacity: 25,000 gpd (95 m³/day) maximum

Start-Up Date

- October 2019

Cost of Treatment Facility (equipment, installation, and administrative fees)

- ~ \$444,000

User Fees

- \$739/EDU annually

Collection System

- Transitioning from grinder to liquid-only (effluent) sewer

Primary Treatment

- Transitioning from large tanks for grinder waste to Orenco® on-lot, liquid-only pump packages

Pre-Anoxic Tankage

- Two 32,000-gal. (121-m³) tanks from the previous treatment system repurposed as pre-anoxic tanks with flow equalization

Secondary Treatment

- Two AdvanTex® AX-Max™ units

Disinfection

- Chlorine injection

“Project Overview” continued on back.

Continued on next page

GRIZZLY RANCH, PORTOLA, CALIFORNIA



At Grizzly Ranch, failing on-lot grinder pumps are now being replaced with an on-lot tank and liquid-only sewer package from Orenco Systems. In a liquid-only system, primary-treated effluent is pumped to the treatment facility by long-lasting, low-horsepower pumps. (Photo courtesy of Pace Supply.)

system on each lot, with waste being pumped to a large sequencing batch reactor (SBR) treatment plant. Unfortunately, the on-lot grinder pumps were breaking down every few years, costing the Grizzly Ranch Community Services District (CSD) about \$3000 for each repair or replacement.¹

An additional problem was the SBR requiring a minimum of 10,000 gallons per day of wastewater before it could operate. Because of the development's slow buildout, the SBR had never been operational. Only 52 homes had been completed, and many of them were vacant for part of the year. This meant that the CSD had to pay for the community's wastewater to be hauled away for treatment elsewhere, at the cost of \$175,000 to \$200,000 a year.²

Aaron Corr, General Manager of the CSD, had heard about Orenco Systems® technologies through a contact at nearby Gold Mountain CSD. Gold Mountain uses a liquid-only sewer in which on-lot systems perform primary treatment, with the effluent then released into common leach fields at a central location.

Corr contacted Orenco for more information as he began to investigate the possibility of using liquid-only

systems with the low-pressure sewer infrastructure already in place at Grizzly Ranch. He was encouraged to learn about the high-head pumps used in Orenco's liquid-only systems and how they can last up to 25 years.³

In the spring of 2018, Corr met with Bill Beck of Orenco and Chris Hartman of Pace Supply (an Orenco dealer), along with Daniel Smith, a retired Grizzly Ranch resident with a background in wastewater and management who was serving as the community's wastewater project manager.

Corr led the group on a tour of the Grizzly Ranch SBR treatment plant, which had been installed a few years before but had never been put into service, due to low wastewater flows. After learning that the CSD was paying a lot of money to haul residents' wastewater to another treatment facility, Beck and Hartman proposed the idea of replacing the SBR with an AdvanTex® AX-Max™ treatment system, which could start up immediately after installation, despite low flows and cold winter weather.

Not only could an AdvanTex system provide immediate year-round treatment of inconsistent flows, but it could also be installed in stages as the development

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GRIZZLY RANCH, PORTOLA, CALIFORNIA

built out. And it would produce high-quality effluent that could be pumped to the community's golf course irrigation pond and used as needed throughout the year. As an added bonus, no leach fields would be necessary.

Corr and Smith began researching the proposed systems and met with staff at Shaw Engineering to develop a plan. They also met with both county and state regulators to ensure that any proposal would be permissible before presenting it to the Board of Directors for the Grizzly Ranch Community Service District.

Orenco Technologies Fit the Bill

The Board decided that a smart first step to solving its wastewater problems would be to replace all failing grinder pump systems with on-lot tanks and liquid-only sewer packages from Orenco. All new construction would use that same technology.

In a liquid-only sewer system, the onsite primary tankage provides passive anaerobic digestion that reduces the organic and solids load to the wastewater treatment facility. Primary-treated effluent from the tank's "clear zone" is pumped with individual ½-hp (0.37-kW), 115-VAC effluent pumps through small-diameter force mains to the treatment facility. Orenco's long-lasting, low-horsepower effluent pumps lead the industry with an optional, 10-year limited warranty.

An additional benefit of liquid-only sewers is that they provide years of anaerobic digestion. Textbook process evaluations indicate that typically 80% of biosolids in onsite tanks are digested on an annual basis.⁴ This lower organic and solids load from the liquid-only system provides a substantial reduction in power costs at the treatment facility.⁵ A lighter organic load also means that the size and capital cost of the facility can be reduced.⁶

The Board also agreed with the recommendation that the SBR be replaced with an AdvanTex AX-Max Wastewater Treatment System. Two AX-Max units would make up the phase-1 installation, capable of treating up to 25,000 gallons (95 m³) per day. Additional units could easily be added as the development built out.

AdvanTex treatment systems use a fixed-film, attached growth treatment process and are an excellent

solution for small communities and small-flow applications. In an AdvanTex system, wastewater is uniformly distributed onto the textile media in an unsaturated condition. The system uses fractional-horsepower fans to draw air through the media and provide sufficient oxygen for aerobic digestion. Low-horsepower, high-head turbine pumps operate intermittently with sophisticated controls that automatically adjust recirculation ratios and pump run-times based on daily flows.



An AdvanTex® Treatment System was chosen because it can handle low and inconsistent flows and be put into operation soon after installation.

(Photo courtesy of Pace Supply.)

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GRIZZLY RANCH, PORTOLA, CALIFORNIA



These two AX-Max™ units make up the Grizzly Ranch phase-1 installation, capable of treating up to 25,000 gallons (95 m³) per day. More units can easily be added as the development builds out. (Photo courtesy of Pace Supply.)

The AdvanTex system was up and running in October 2019, with the CSD’s water treatment operator taking on the part-time duties of wastewater operation and maintenance. Because the treated effluent is now available for reuse to irrigate the golf course, the facility has been reclassified for wastewater reclamation.

Corr says, “Orenco’s wastewater solutions were great remedies for our situation. We now have year-round, immediate treatment and the ability to treat inconsistent flows. And the AdvanTex treatment system has freed up money for us to be able to replace each existing grinder pump [with an Orenco liquid-only sewer package] as time allows.”

¹ Per Grizzly Ranch Community Services District.

² Ibid.

³ As seen in the Elkton, Oregon, sewer system.

⁴ Metcalf & Eddy, Inc. Wastewater Engineering: Collection, Treatment, and Disposal. New York: McGraw-Hill, 1972.

⁵ As seen in the Montesano, Washington, sewer system.

⁶ Ibid.

Data used by Orenco to derive the representations and conclusions contained within this Project Profile were current as of April, 2020.

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Dispersal/Discharge

- Treated effluent reused on golf course or collected in storage pond

Monitoring and Control

- Orenco Controls™ TCOM™ panel with touchscreen

Equipment Supplier

- Pace Supply, Yuba City, CA

Operation and Maintenance

- Grizzly Ranch Community Services District

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~ **Aaron Corr**, Grizzly Ranch Community Services District

For information about Prelos™ Sewer, AdvanTex® Wastewater Treatment, or Orenco Controls™, contact Orenco Systems®, Inc.



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