

## Production Efficiency: City of Astoria Wastewater Treatment



*Through wind, rain and storm-tossed seas, Astoria's new wastewater treatment system helps Jon Garland, plant operator, trim energy costs and improve efficiency.*

### PROJECT OVERVIEW

**Who:** City of Astoria, Wadsworth Electric, Aeration Industries International, Inc., Energy Trust of Oregon, Inc., Oregon Department of Energy, and Pacific Power

**What:** An energy-efficient compressed air wastewater aeration system replaced a 25-year-old mechanical system to lower energy bills

**When:** Completed in October 2003

**Where:** Astoria

**Benefits:**

- Lowers operating costs
- Reduces energy use
- Aerators operate only when needed
- Wastewater is processed more quickly

**Annual Energy Savings:**

Estimated at 546,884 kilowatt hours per year, for projected annual savings of \$22,750

### Aeration System Stirs Up Savings

An efficient new aeration system is adding nearly \$23,000 in annual energy savings to the mix at Astoria's wastewater treatment facility. Besides giving the coastal town's budget a boost, the system is doing a better job of processing wastewater to a level of purity that allows its discharge into the Columbia River.

The aerator upgrade was identified as an energy saving strategy through an energy-efficiency study sponsored by Pacific Power. When Astoria decided to invest in the \$341,000 system, they took advantage of a \$100,000 incentive from the Energy Trust of Oregon, Inc., and a \$224,000 loan from the Oregon Department of Energy to cover about 95 percent of the costs. The city expects to pay off the loan in approximately 10 years.

Before the new equipment was installed in October 2003, oxygen was mixed into the wastewater ponds with a 25-year-old mechanical aeration system that operated primarily on the surface. The old system, which ran on 40 horsepower motors that operated constantly, used approximately 920,000 kilowatt hours (kWh) of electricity each year. The new system is expected to use only 375,000 kWh thanks to more efficient motors that operate only when needed. When oxygen levels drop below the ideal point, sensors activate the aerators and later shut them down when appropriate levels are achieved.

Mixing oxygen into the wastewater ponds creates the ideal environment for natural organisms to break down waste. "We have a biological system that basically allows nature to do its work in a space that we define," says Jon Garland, plant operator. "The only chemical we add is chlorine for disinfection."

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"The system is not only more energy efficient, it's also more production efficient," says Mitch Mitchum, Astoria public works director. "It produces more aeration because it injects compressed air into the mixing. The old aerators were simply mechanical devices. This is a combination of a propeller device with injected air, which greatly increases the aeration efficiency. Our measurements indicate a much higher oxygen level now."

Aeration Industries International, Inc., produced the Aire-O2 TRITON aerator/mixer system and provided technical assistance to Wadsworth Electric, which was the general contractor for the project. "The machines required a complete upgrading of the electrical plant that supplies the

aerators," says

Mitchum. "Wadsworth did all that work with their local staff and did a great job working with Aeration Industries' technicians to install the system." ■



***Aerators driven by energy-efficient motors, which are activated by oxygen sensors, help reduce energy use by nearly 60 percent at Astoria's wastewater treatment plant.***

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Energy Trust of Oregon, Inc.  
733 SW Oak Street, Suite 200  
Portland, Oregon 97205

Toll Free: 1-866-368-7878  
Facsimile: 503-546-6862  
[www.energytrust.org](http://www.energytrust.org)

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of Oregon, Inc.