

DURHAM | WATER RESOURCE RECOVERY FACILITY



AERIAL VIEW OF DURHAM WATER RESOURCE RECOVERY FACILITY IN TIGARD,

Durham Water Resource Recovery Facility is a nationally acclaimed, state-of-the-art facility, serving Washington County residents in the cities of Beaverton, Durham, King City, Sherwood, Tigard, and Tualatin, and small portions of southwest Portland and Lake Oswego.

The facility, located in Tigard near Cook Park and Tigard High School, cleans an average of 22 million gallons of wastewater per day to among the highest safety and quality standards in the nation. Through innovative, advanced technology and processes, wastewater collected from homes and industry is cleaned and returned to Washington County's only river – the Tualatin, actually enhancing the health of the river. Cleaned wastewater is also used for local irrigation, and natural byproducts of the treatment process are converted to electricity, heat, and used as soil amendments at local sites and throughout the state.

The Durham Facility provides advanced wastewater treatment, also known as tertiary treatment, exceeding the treatment level of 98 percent of wastewater facilities in the United States. In 2009, the first commercial nutrient recovery facility in the nation was built at Durham through a Partnership with Ostara Nutrient Recovery Technologies in Canada. The facility captures 80% of the phosphorus from the wastewater stream and converts it into a premium, slow release fertilizer used on turfs and nurseries throughout the northwest and elsewhere.

The Durham Facility began operations in 1976 to reverse decades of severe water pollution in the Tualatin River and its tributaries, and to meet the demands of a growing population. The facility centralized a scattered system of 14 inefficient wastewater treatment plants, creating one of the most efficient and advanced facilities in the world.

DURHAM FACTS

- Provides a higher level of treatment than 98 percent of the facilities in the nation.
- Must meet nearly 1,000 strict permit conditions, including monthly, weekly and daily limits established to protect the Tualatin River.
- Cleans an average of 22 million gallons of wastewater per day.
- Recycles more than 50 million gallons a year of cleaned wastewater for local irrigation.
- Recycles more than 14 dry tons of biosolids daily for use as a soil amendment.
- Produces over 300 tons of Crystal Green®, a commercial, high value fertilizer.
- Cleans wastewater for nearly 250,000 residents of Beaverton, Tigard, Sherwood, Tualatin, Durham, King City, and portions of Clackamas and Multnomah Counties.
- Cogeneration system and solar panels provide 60 percent of the plant's electricity needs.

(see next page)



DURHAM | COGENERATION SYSTEM TURNS WASTE TO WATTS

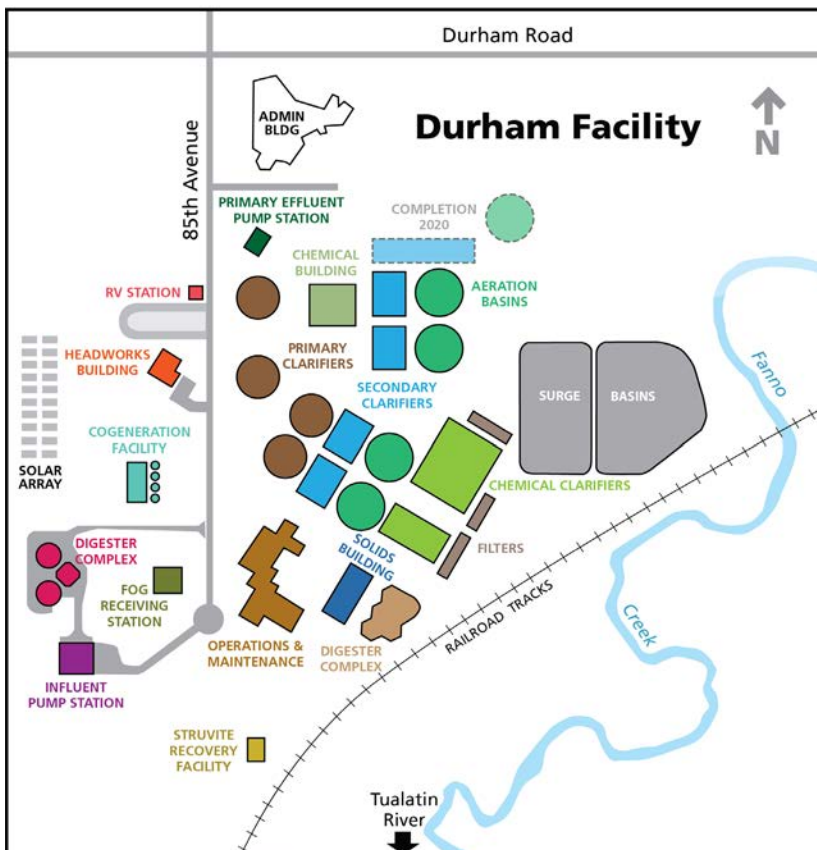
In 2016, Clean Water Services (CWS), Energy Trust of Oregon and the Oregon Department of Energy dedicated a new cogeneration system that converts wastewater and food grease into clean, renewable energy. With this innovative system, the Durham Treatment Facility is the third water resource recovery plant in Oregon to co-digest fats, oils and grease.

The new system triples Durham's renewable energy generation, producing 60 percent of the electricity needed to run the water resource recovery facility when coupled with its existing 403-kilowatt solar electric system. Renewable electricity and heat produced will be used onsite, reducing CWS's energy costs by nearly \$800,000 annually, ensuring value for ratepayers. Generating clean, renewable energy from biogas reduces greenhouse gas emissions and helps Oregon meet its carbon reduction goals.

Since 1993, Durham has operated a 500-kilowatt cogeneration system using biogas from treatment of the communities' wastewater to offset its own energy usage. By replacing this

smaller engine with two new engines, Durham now has a 1.7 megawatt cogeneration system fueled by biogas produced from the anaerobic digestion of municipal wastewater solids as well as fats, oils and grease (FOG) collected from Washington County restaurants and others. FOG, also known as "brown grease," is pumped out of restaurant grease traps and interceptors at regular intervals.

This is just the latest project where Clean Water Services and Energy Trust have teamed up to invest in projects that save and generate energy. Since 2004, Clean Water Services has worked with Energy Trust on more than 100 energy-saving improvements throughout its facilities – everything from large-scale capital improvements to new energy-efficient lighting, pumps and drives and operations and maintenance improvements. This has resulted in more than 9 million kilowatt-hours of electricity saved per year for Clean Water Services, and lower utility bills and operating costs translates to saving for their ratepayers.



Size and scope:

- 1.7-megawatt cogeneration system: two Jenbacher 848-kilowatt cogeneration reciprocating engines fueled by biogas, not fossil fuel
- Annual expected generation: ~12,300 megawatt-hours per year
- Combined with the 403-kilowatt solar electric system, expected generation is more than 12,800 megawatt-hours per year – enough electricity to power 1,100 homes for a year and will help avoid producing 6,000 tons of carbon dioxide
- Average gallons of fats, oils and grease (FOG) co-digested per week: 70,000, moving up to 100,000 gallons with next six months
- Cost: \$16.8 million
- Energy Trust of Oregon incentive: \$3 million
- Oregon Department of Energy Tax Credit for combined heat and power: \$2.8 million

Benefits:

- Cuts Clean Water Services operating costs saving money for ratepayers
- \$690,000 first year annual estimated savings in electrical costs.
- \$100,000 first year annual estimated savings in heating costs.
- Generates \$340,000 annually in tipping fees for FOG disposal
- Keeps fats, oils and greases out of pipes and treatment plant, saving operating costs and preventing sewer backups
- Reduces the level of greenhouse gases released into the environment
- Recovers waste that would be otherwise be disposed of or landfilled
- Advances sustainability goals for Oregon

 Clean Water Services

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