

Frederick-Winchester Service Authority

Winchester, Virginia



Project Size
\$45 Million

“ The Green Energy Facility will not only provide food processing companies with local, sustainable, cost-effective, and environmentally-sound waste disposal solutions, it will also significantly promote local economic growth by creating jobs and attracting new businesses and revenue streams to the area.”

Jesse Moffett ,
FWSA Executive Director

The Frederick Winchester Service Authority (FWSA) signed a \$45 million energy performance contract with Energy Systems Group (ESG) for the design and construction of comprehensive energy efficiency and infrastructure improvements at the Opequon Water Reclamation Facility. This 12.6 million gallon per day enhanced nutrient removal facility has very strict nitrogen and phosphorus removal requirements necessary to help preserve the well-being of the Chesapeake Bay. This project is anticipated to achieve operational savings that will cover not only the cost of the project, but create a revenue stream for FWSA, that will stabilize rates for its customers and promote existing and future economic development in the Winchester City and Frederick County area.

The centerpiece of the FWSA project is the construction of a Green Energy Facility, which will process municipal sludge and high-strength organic waste to produce methane gas, a renewable fuel, through the process of anaerobic co-digestion. This methane gas will be utilized to generate up to 848 kilowatts of electricity that, at start-up, will meet more than 50 percent of the treatment plant's electrical needs. This facility also includes a new sludge dewatering process that reduces the use of chemicals and significantly reduces the amount of biosolids hauled to the Regional Landfill for final disposal, by approximately 50 percent.

The Green Energy Facility will also harvest phosphorus from the wastewater stream, a rare element that is an essential ingredient for fertilizer and crop production. The facility is scheduled to be operational in 2016.

Treatment Infrastructure Renewal

- Anaerobic digestion: Three (3) 1.25 million gallon digesters, 13,000 sf control building housing switchgear, lab, boilers, heat exchangers, grinders, pumps, compressors
- Dewatering: Gravity belt thickeners, belt filter presses, polymer feed pumps, progressive cavity pumps and associated electrical
- Controls: SCADA control system upgrade
- Electrical: New primary 12.5 kV switchgear unit, 800 kW emergency power system interconnected to cogeneration, net metering/grid paralleling capability
- Aeration: Replace Four (4) 450hp multistage blowers with Four (4) 200hp turbo blowers, new electrical, fine bubble diffusers, piping and controls

Green Energy & Resource Recovery

- 848 kW electric cogeneration with biogas conditioning system
- High strength food waste and FOG receiving facility with segregated waste storage
- Ostara Pearl® phosphorus nutrient recovery system

Facility Efficiency Improvements

- Building energy management control system
- Lighting and mechanical system improvements
- Potable water system upgrade

Energy Systems Group (ESG) is a leading energy services provider that specializes in energy efficiency, sustainability, and infrastructure improvement solutions in the government, education, healthcare, commercial, and industrial sectors. ESG offers a full range of sustainable infrastructure solutions including waste-to-energy, distributed generation, and renewable energy.

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