

# Breath of Air

## HIGH-SPEED TURBO BLOWERS PLAY A CENTRAL ROLE IN A TEXAS TREATMENT PLANT'S ENERGY EFFICIENCY UPGRADE PROJECT

By Pete Litterski

Operators at the Grace Creek Wastewater Treatment Plant in Longview, Texas, expect significant savings from an energy efficiency project that includes replacement of two of five older aeration blowers with high-speed, high-efficiency units.

The project is part of a \$1,045,625 project that also includes a cogeneration power plant with a 65 kW microturbine that operates on digester methane. The projects were funded in part by a \$781,900 Energy Efficiency and Conservation Block Grant from the U.S. Department of Energy, according to Shawn Raney, chairman of the city's Energy Management Committee. The grant was supplemented by money from the city Water Utilities Fund.

Scott Baggett, plant manager at Grace Creek, says the aeration blower project designed by KSA Engineers will offer many benefits. The new APG-Neuros NX 150 turbo blowers — a 125 hp unit and a 150 hp unit — operate on air bearings, making them energy efficient, low maintenance, and quiet. The blowers are now the primary units in the aeration system. The 150 hp blower can be routed to either of the two pairs of aeration basins at the plant. The 125 hp blower is routed to a pair of square basins next to the blower room.

### SUPERIOR CONTROL

"The biggest thing they do is give us more control over our dissolved oxygen," says Baggett. "We're going to be able to keep the bugs happy."

Although the blowers are more energy efficient than the old ones, "The real savings will come because we're not pushing 7 or 8 mg/l DO when we only need 2 to 4," Baggett says. The greater control comes from the flexibility of the new blowers and the use of real-time monitoring. Controller units that constantly track the dissolved oxygen levels in the four aeration basins and then control the new pneumatic actuated K-Tork butterfly valves installed in the blower room and at the basins.

The aerator project included the upgrades of two controllers from Hach SC-100 to Hach SC-1000 units. Each of the controllers is linked to a pair of basins and connected to probes that track dissolved oxygen, pH and MLSS levels.

Once optimal dissolved oxygen levels



Scott Baggett, plant manager at Longview's Grace Creek Wastewater Treatment Plant, looks at one of the new pneumatic actuated K-Tork butterfly valves that help operators maintain the proper airflow in the plant's four aeration basins. (Photos by Pete Litterski)

Before and After: Three of the old blowers at Longview's Grace Creek Wastewater Treatment Plant will remain available as backup units to the two new APG-Neuros NX 150 aerator blowers installed in part with a federal grant.



### What's Your Story?

**TPO welcomes news about environmental improvements at your facility for future articles in the Greening the Plant column. Send your ideas to [editor@tpomag.com](mailto:editor@tpomag.com) or call 877/953-3301.**

are programmed into the system, Baggett says, the controllers can determine how far to open the valves. Each of the new blowers, which have variable-frequency drives, can modulate according to what the valve is allowing. "As the DO goes up, the valve closes down, and the pump responds to the lower demand," says Baggett.

With the new system, the controller can make real-time decisions that in the past would have required an operator's undivided attention.

### TRACKING THE SAVINGS

The energy savings are expected to be significant. The city contracted with the local electric utility, AEP-SWEPCO, to have the CLEAResult energy optimization company audit the aerator system before the two old units were taken offline. With that baseline in hand, the company returned after the new blowers were fully operational and performed another audit.

CLEAResult found the peak demand and energy usage reductions were higher than originally estimated because the VFDs allow the blowers to operate more efficiently, running at a consistently lower threshold, instead of intermittently spiking. Actual peak demand savings were 50.3 kW, versus the estimate of 26.4 kW. Electricity usage declined by 440,628 kWh per year, versus the estimate of 230,000 kWh.

The three older blowers still online have been relegated to backup status and will be used only during peak demand or when one of the new blowers has to be taken down for repairs or maintenance. If the

“The biggest thing the blowers do is give us more control over our dissolved oxygen. The real savings will come because we’re not pushing 7 or 8 mg/l DO when we only need 2 to 4.”

**SCOTT BAGGETT**

funding can be found for another project, Baggett would like to replace the rest of the older blowers with the new models.

**HEATING AND POWER**

The cogeneration system will deliver still more energy savings. Just a few feet from the stack where the plant once flared excess methane from four anaerobic digesters, the gas now makes a left turn to the turbine. Power from the system runs the biosolids press, but since the press only runs four days per week, the city sells surplus power to AEP-SWEPCO.

Raney says the city sells the excess power for about 50 percent more than it pays for electricity. “We pay 4.01 cents per kWh, but we sell the power at 6.1 to 6.2 cents,” he says.

The methane is routed to the facility’s digester control building, where a gas pressure transmitter and flowmeter track gas production. Raw methane is routed to the digester heaters as needed, and the rest is piped to an underground vault about 50 yards from the digester building.

At the vault, gas lines were reconfigured, giving operators the option of routing methane to the cogeneration system or, if necessary, to the flare stack. Since the cogeneration unit came online, the plant has not flared any gas. The cogeneration system is expected to reduce the plant’s greenhouse gas emissions by more than 700,000 pounds per year.

**CONDITIONED GAS**

The engineer/project manager for the cogeneration system was Willard Jordan, P.E., of Longview-based Electrical Expertise. The installation contractor was James D. White Electric of White Oak, Texas. The skid-mounted cogeneration unit includes a gas conditioning system from Unison Solutions that filters, dries and compresses the raw gas.



Unit 3 in the blower room at Longview’s Grace Creek Wastewater Treatment Plant is a new APG-Neuros NX 150 aerator blower that can be used to supply air to any of the four aeration basins at the facility.

The treated gas feeds a Capstone C65 microturbine generator that operates at 96,000 rpm. Near the generating unit, a concrete pad holds a programmable logic controller and a pair of chillers that deliver cooling water.

All the licensed operators at Grace Creek received training on the cogeneration system and can be called on to check its status and make necessary adjustments. The system also can be accessed remotely by support personnel at Unison Solutions and at Pumps & Services, a New Mexico company that provided the training on the cogeneration system. **tpo**

## High Efficiency Air Bearing Turbo Blower



**Clean  
Compact  
Affordable  
Energy Efficient**

**APG-Neuros offers efficient and affordable Direct Drive high speed turbo blowers and aeration systems for municipal and industrial customers. Over 460 units installed and more than 130 currently on order in North America.**

- Energy savings of up to 35%
- No heat rejection into the blower room
- Vibration-free operation
- Very low noise
- Up to 50% smaller foot-print
- Lower installation costs
- Up to 20,000 SCFM & 15 PSIG
- Up to 74% flow turn-down



APG-Neuros is a proud  
**Winner of the**  
The Artemis Project  
**Top 50 Competition**  
& APEX  
Sustainability Prize



Proudly made in the USA

Toll Free: 866 592-9482  
Production & Test Facility: 160 Banker Road  
Plattsburgh, NY 12901, USA  
[www.apg-neuros.com](http://www.apg-neuros.com)

