



*Case Study:*

# Reedsport, OR

*Municipal Wastewater Treatment Facility  
Performance Remediation & Energy Use Optimization*

With support from:



## CASE STUDY: REEDSPORT, OR WWTF

Program Sponsor:

Bonneville Power Administration (BPA)  
Northwest Energy Efficiency Alliance

Local Electric Utility:

Central Lincoln People's Utility District

Facility Type:

Municipal Wastewater Facility – Activated Sludge

Contacts:

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Facility Operator

### Facility Overview:

The Reedsport, Oregon WWTF is an activated sludge facility designed for a flow of 1.92 million gallons per day (mgd) and is currently treating approximately 0.75 - 0.9 mgd under dry weather conditions.

The activated sludge process has two parallel trains. Each train has one rectangular aeration basin and a secondary clarifier. Waste sludge from the clarifier is treated in two small circular aerobic digesters with one surface aerator each. Each of the primary aeration basins has two single-speed 30 hp surface aerators.

### The Problem:

At the time of BacGen's initial visit to Reedsport, the facility was running the two 30 hp aerators on a 24x7 basis - with no ability to understand whether or not this was providing the proper amount of aeration throughout the day. As is the case in many facilities, particularly in smaller communities, all Dissolved Oxygen (DO) monitoring was done through daily grab samples, so overnight DO values were unknown.

BacGen audited the facility utilizing two self-logging Dissolved Oxygen instruments that were left in each aeration basin for 21 days. The data generated by those instruments clearly outlined several process optimization opportunities.

First, the data indicated an unequal flow split between the two treatment trains, with Basin 1 receiving higher influent loading and generally possessing less residual DO. Second, it was apparent that excess aeration was being supplied to both basins at several different times throughout the day. Historical records were utilized to acquire seasonal data and further opportunity was identified in process models.



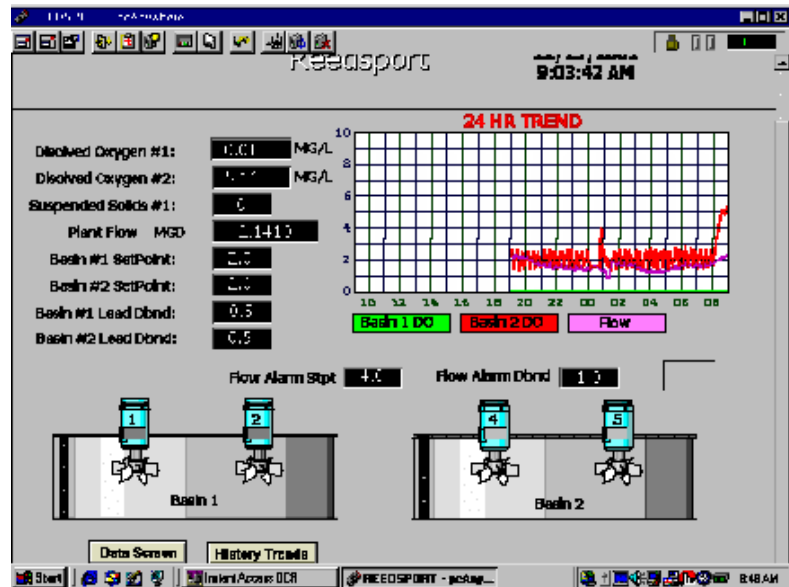
Finally, BacGen determined that the surface aerators in the primary basins were being used for mixing as well as aeration. Although generally inefficient as mixers, the aerators were the only equipment available. The facility had experienced settling problems in the past and it was clear that any new control strategy would have to address these mixing requirements.

**The Project:**

After thorough discussions with facility staff, BacGen determined that a fully automated Dissolved Oxygen control system was the best way to meet all of the process requirements while still optimizing energy consumption. Properly configured, the system would allow operators to establish a desired DO “setpoint” and the system would automatically start and stop the surface aerators to maintain that level.

As a first step, a highly reliable, self-cleaning Dissolved Oxygen/Suspended Solids probe (shown above) was installed in each of the two primary aeration basins. Signals from the probes were acquired by a Programmable Logic Controller (PLC) located in the facility’s Motor Control Cabinet. The PLC was then connected to a Windows-based PC so the operators could access data and change control parameters without having to learn proprietary PLC programming menus.

Cognizant of the mixing element, BacGen also programmed DO control “logic overrides” that forced the aerators to run at pre-set intervals, regardless of Dissolved Oxygen demand. This allowed the operators to feel comfortable leaving the system in an automated mode overnight and on weekends.



**Project Results:**

Optimizing the process saved Reedsport 368,562 kWh in the first year of operations. Factoring in anticipated energy rate inflation over a 20-year project lifetime, total savings related to BacGen’s efforts will likely exceed \$510,000. In addition, the recommended modifications enabled the facility to take its old basin, #1, out of service during the summer for much needed maintenance. BacGen’s facility modeling work had shown that the plant could operate during the summer on one basin while still providing excellent treatment. The plant benefited by both saving energy and using the downtime for basin maintenance.

**For more information on this case study, or for general questions, please contact BacGen at:**

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