

City of Globe installs innovative technology including adaptive mixers for better aeration and energy efficiency

Wastewater treatment plant upgrades replace existing aeration system, realizing better treatment and 50% savings in operating costs

Globe, Arizona is a small-town jewel located about 90 minutes east of Phoenix. Founded as a mining town in 1876, the city is located in the heart of Arizona's Tonto National Forest and surrounded by spectacular mountain vistas. Today, Globe remains an important copper mining center and ranching community.

Challenge

The existing aeration system at the Pinal Creek Wastewater Treatment Facility (WWTF) that serves the City of Globe had been in use since the 1980s. By 2019, the aging equipment had compromised flow circulation and significantly reduced treatment capabilities and energy efficiency.

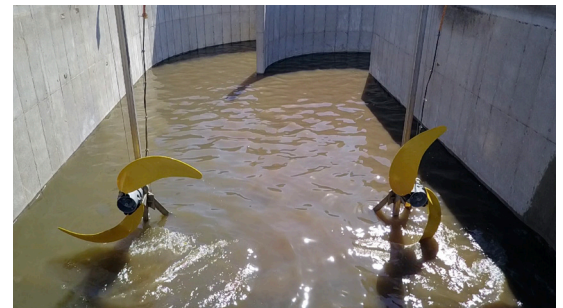
"We had an old jet header system, but we lost a few of the jet headers so that handicapped the system and the circulation," said Frank Baroldy, retired facility manager.

Recognizing the need to rehab and upgrade the WWTF's existing system to improve effluent quality and facility efficiency, the Globe Public Works Department partnered with JCH, Inc. (JCH), a regional equipment provider, and Xylem.

Together, engineers at JCH and Xylem designed a new aeration system that consists of new fixed fine bubble diffuser grids, new slow-speed adaptive submersible mixers, new positive displacement blowers, and process optimization through the Sanitaire OSCAR control system.

Solution

As part of the upgrades, the city sought to replace its jet aerators to improve aeration and energy efficiency. The complete solution provided by JCH and Xylem, includes a Sanitaire Bioloop oxidation ditch that uses dedicated Flygt adaptive mixers and Sanitaire aeration to provide flexibility and energy efficiencies that traditional mechanical aeration/mixing systems can't match.



Two Flygt adaptive mixers regulate channel velocity, reduce air requirements, and keep particles in suspension.

CUSTOMER: Globe, Arizona

CHALLENGE: The City of Globe, Arizona, sought to upgrade the existing aeration system at the Pinal Creek Wastewater Treatment Facility to improve treatment, increase energy efficiency and prevent settling in the treatment tanks.

XYLEM SOLUTION: JCH, Inc. and Xylem designed and installed a complete solution, which included the Sanitaire Bioloop oxidation ditch, two Flygt adaptive mixers and the OSCAR process performance optimizer.

The Bioloop provides air from the bottom, utilizing full floor aeration coverage. The fine bubble diffusers are installed as grids along designated portions within the oxidation ditch, allowing the respective oxidation ditch to operate with simultaneous nitrification and denitrification. With the aid of the Flygt adaptive mixers, the channel velocity within the Oxidation Ditch is kept at a minimum velocity of 1 foot per second to prevent settling, without adding additional air that would be needed if used to prevent settling.

To save on costs, an existing raceway oxidation ditch built in 1986 was retrofitted to accommodate the Sanitaire Bioloop treatment solution and two adaptive mixers. When the ditch was emptied for the new system installation, crews discovered six feet of sludge at the bottom, resulting from the prior systems inability to keep the wastewater contaminants in solution.

The WWTF also installed the OSCAR process performance optimizer to continuously regulate the Bioloop oxidation ditch. The OSCAR system identifies the amount of air going into the treatment process and in response, the speed of the Flygt adaptive mixers adjusts automatically to the correct thrust needed to keep the velocity in the ditch that prevents solids settling.

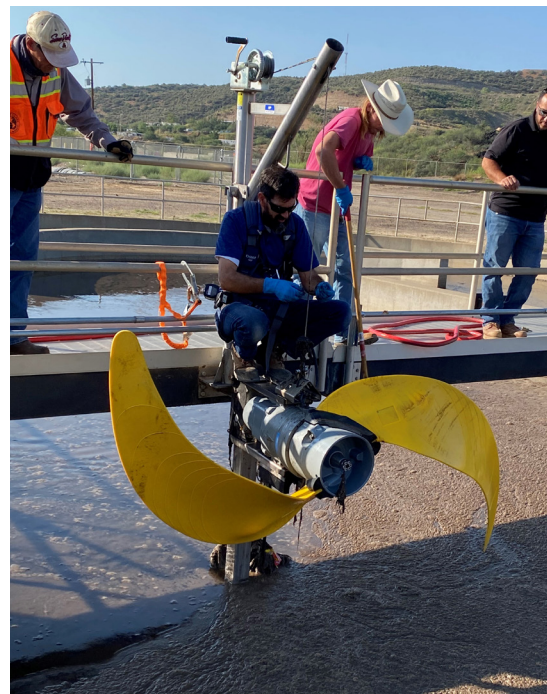
Results

Since the completion of the retrofit project, the WWTF has realized a savings of over 50% in operating costs. According to current facility manager Vince Mariscal, the WWTF has seen several benefits from using the adaptive mixers, including an increase in energy efficiency and savings, less time spent maintaining the mixers and improved quality of effluent.

“In regards to energy savings, we’ve seen 50% in reduction of energy use,” said Mariscal.



An existing oxidation ditch was retrofitted with a new Sanitaire Bioloop treatment solution, including Flygt adaptive mixers.



The Pinal Creek Wastewater Treatment Facility has seen a 50% reduction in energy use since project completion.

Xylem, Inc.
4828 Parkway Plaza Blvd., Suite 200
Charlotte, NC 28217
Tel 704.409.9700
Fax 704.295.9080
855-XYL-H2O1 (855-995-4261)
www.xylem.com

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