PLANTPROFILE

NAME:

Ypsilanti Wastewater Treatment Plant

LOCATION:

Ypsilanti, Mich.

PLANT SIZE:

46 mgd

INFRASTRUCTURE:

Primary settling tanks, aeration tanks, final settling tanks, biofilter facility, biosolids handling pumps and storage silos

The pumps in place at YCUA continually move cake, which has been increased in solids content from 3% to as much as 25%.

Leonard Casey, the maintenance mechanic, oversees enough biosolids material each day to fill a football field 2 ft deep.

Ypsilanti plant managers have accomodated double-digit population growth and now can handle peak flows to 72 mgd.

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By Clare Pierson

A Biosolids Overhaul

A southeastern Michigan WWTP upgrades equipment line in order to streamline processes

Built in 1982, the Ypsilanti, Mich., wastewater treatment plant (WWTP), operated by the Ypsilanti Community Municipal Authority (YCUA), has already increased capacity twice, expanding from its original rate of 29 million gal per day (mgd) to a current volume of 46 mgd.

The facility's sludge treatment area, once basic in design and limited in functionality, has expanded and ensures steady, uninterrupted movement of bio-solids from primary storage tanks all the way through to incineration. A complete solids-handling system, including four pumps and a series of sliding-frame silos, provides primary and backup service, ensuring multilevel redundancy, peace of mind and efficiency.

24/7 Service

Each day, enough biosolids material is processed in the plant to fill a football field that is 2 ft deep.

"Compared to a plant like Detroit's, we are a small facility, but that's still a scary mental image," said Leonard Casey, YCUA's maintenance mechanic. "This facility takes in and processes wastewater from a fairly wide area around Ypsilanti, and we have a commitment to area residents to ensure 100% uptime. We don't have the luxury of being able to say we are 'temporarily out of service' that some businesses have."

Collectively, the plant's total area of service represents a population of more than a quarter million residents. When the plant was built in 1982, populations were projected to be approximately 148,000 by 1994. Area growth has outpaced those early projections, and the population is currently more than 250,000. Yet, the YCUA has been able to keep pace with that growth.

The most recent expansion of the plant boosted capacities to 46 mgd—almost a 59% increase—with an ability to handle peak instantaneous flows of 72 mgd. To accommodate that added capacity, dramatic expansions to the primary treatment area of the plant took place, including construction of new primary settling tanks, aeration tanks, final settling tanks and a new biofilter facility. Significant changes also were made to the biosolids-handling operation. Equipment went out for bid to supply all components for the biosolids-handling upgrade. Ultimately, plant officials selected Schwing Bioset, Inc. (SBI), Somerset, Wis., as a single-source supplier for all equipment for that job.

New Approach

In its earlier design, cake at YCUA was dewatered through four filter presses and routed directly to a multiple-hearth incinerator. A new fluid-bed incinerator and increased capacity were added, making this process more efficient. Cake at the facility is now run through as many as nine belt presses, dropped onto distribution conveyors and fed to a pair of SBI 10-ft-diameter, 940-cu-ft sliding-frame silos.

The buffer in the dewatering area is necessary to ensure a steady, continuous flow of cake to the incinerator—critical for efficient operation and avoiding a costly, time-consuming shutdown and restart. In the event of an unforeseen slowdown or surge in output, the storage silos provide several hours of operational capacity to keep the incinerator fed while any issue is being resolved.

The site of the second set of 24-ft-diameter sliding-frame silos, the truck loading operation, is a huge improvement over the previous area designated for this activity, said Kurian Joychan, YCUA's director of wastewater operations.

"The truck loading area is used when the incinerator is out of operation—either for planned maintenance or an unforeseen problem—and sludge has to be hauled to the landfill," Joychan said. "This new [system] is outstanding; we can drive 20-yd trucks in and have them loaded in under 20 minutes. The truck-loading silos are designed with multiple outlet locations to evenly load trailers and to accommodate trailers with varying dimensions."

Because of zoning restrictions, the loading area is operational only between the hours of 6 a.m. and 6 p.m. The plant itself, however, is operational 24/7, meaning the cake has to go somewhere during off-hours. That is when the silos are invaluable, according to Joychan.

Best Practices

The pumps in place at YCUA (four SBI KSP 65 pumps) are called upon to continually move cake which, after dewatering, has been increased in solids content from about 3% to as much as 25%.

The maintenance requirements are minimal, but the benefits of performing them are touted by YCUA plant officials, who say a prescribed maintenance regimen can extend the life of a pump by as much as 10 years.

At any given time, only one of plant's four pumps will be in action, with the other three in place to provide operational flexibility for the dewatering operations. This has allowed the Ypsilanti WWTP to operate one of the Midwest's most reliable, efficient wastewater treatment facilities. WWD

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