

Case Study

Aeration solution for sludge tank

By Chris French | October, 2018

Chopper pump solves odor problems for a dairy processing plant.

At one of California's oldest independent dairies in north San Diego County, a chopper pump with nearly five years of uninterrupted service has provided an odor-solving aeration solution for the dairy's sludge tank.

Background

Hollandia Dairy began in 1949 when Arie de Jong and his wife, along with their 10 children, settled in Poway, California. They arrived from the Netherlands where de Jong worked in the dairy business. With few possessions, their new life in the U.S. started with only \$32.

One year later, the family purchased a dairy on the corner of Felicita and Highway 395, now Centre City Parkway, in Escondido. Initially, sales averaged \$8 a day, but Hollandia Dairy began to take its first steps, confident that its milk wasn't "just another milk" Today, the dairy employs more than 175 people.

The challenge

The dairy's previously installed side-entry mixer from a different manufacturer was failing to prevent buildup of odorous septic sludge in a 35,000-gallon bolted steel equalization tank (18.5 feet in diameter by 18.75 feet in height).

"Our old side-entry mixer just wasn't mixing the tank anywhere near enough, so odors were building up" said Hank Van Nieuwenhuyzen, chief operations officer at Hollandia Dairy. "Since the humble beginnings of Hollandia Dairy, we have always endeavored to be good neighbors,



Landias AirJet at Hollandia Dairy

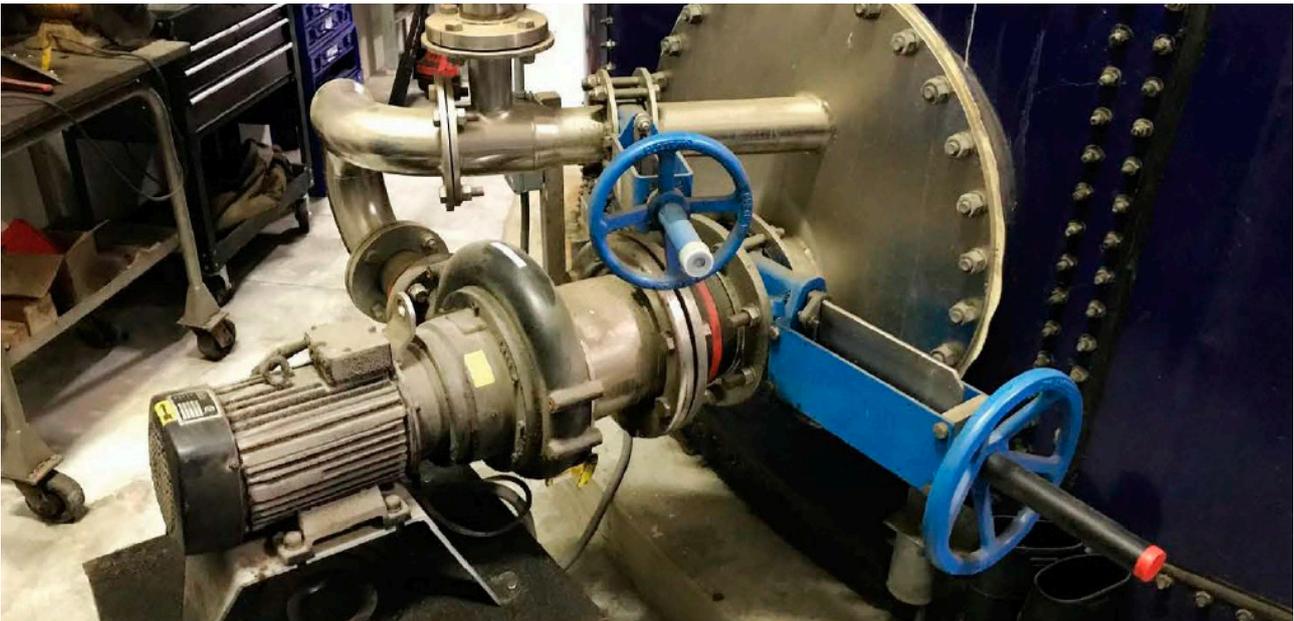
so investing in a much better mixer was a must. On several occasions, we had to drain the tank to empty out the sludge, which was no fun at all - and very time-consuming."

The solution

Hollandia contacted ES Engineering to find a solution. Carbon filters were introduced, but this was only a temporary measure.

"At Hollandia's milk processing plant in San Marcos, it was clear to us immediately that this family-owned business cared about the environment and took the situation with its equalization tank very seriously" said Christian Tasser, ES Engineering's project manager who worked on the project and is now with Carollo Engineers.

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“We looked at how we could best prevent the tank’s contents from going septic, taking measures to reduce pH levels and see what would be best, especially for peak production times:” said Tasser. “The wastewater, including effluent from Hollandia’s fruit juice manufacture, didn’t pose a big problem with solids content, but the existing mixing system wasn’t up to the job.”

Looking for an instant, yet long-term solution, Tasser maximized a newly purchased Landia AirJet chopper pump by recirculating the foul air from the top of the tank down through the wastewater, effectively scrubbing the sulfur out of the air to eliminate the odor issues. This setup is similar to Landia’s GasMix system increasingly installed for mixing of anaerobic digesters in wastewater treatment facilities and industrial biogas plants.

The AirJet, which was sourced and installed by World Water Works Inc., combines a chopper pump with a venturi nozzle. It addressed the dairy’s problem of odor issues by creating a mechanical rotation of the whole tank. Typically, odor will be caused by not enough oxygen getting into the tank, or more likely, sufficient oxygen but with inadequate mixing. This leads to aerobic and anaerobic conditions, with the latter responsible for unwanted odor.

The simultaneous aerating and mixing created by the AirJet allows the chopper pump to continuously reduce particle sizes using its external knife system to prevent any solids from entering the pump’s casing. With the enhanced mixing adding oxygen, thus lowering density, any solids that have formed, such as fat/fibrous lumps, are broken up.

The venturi nozzle can be angled to suit, but it is usually mounted horizontally. Combined with the chopper pump, oxygen reaches all parts of the tank, rather than only aggressively mixing the immediate area.

Conclusion

According to Tasser, the advantages of the AirJet include reliability and lower capital costs, and there’s no need for energy-intensive blowers or adding chemicals to the tank.

“Installation was easy through an existing manway, so no additional holes were needed in the wall of our tank,” said Nieuwenhuyzen. “And in nearly five years of operation, we’ve not had any problems at all with the Landia AirJet and haven’t had to clean out the tank once. Our odor problems have been solved.”

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