

Komax Klean Wall™ Sludge Heat Exchanger Provides Efficient Non-clogging Solution for Dairy Cow Waste



Case 934

Threemile Canyon Farms in Boardman, Oregon is known for their green practices and sustainable farming. A diversified enterprise, Threemile grows 200,000 tons of potatoes annually and runs nearly 41,000 head of dairy cattle on the 93,000 acre farm.



View of the Threemile Canyon Farm

Recently, they decided to install an updated animal waste sludge digester in order to improve the quality of their wastewater effluent and capture methane gas for energy production. Their unique pit digester design included installing 31,000 tires at the bottom of the digester to facilitate bacteria growth and maximize gas production.



31,000 tires installed (left) and digester cover in place (right)

As the solids content of the sludge often approached 7% solids, the spiral heat exchangers on their previous digester system used in preheating sludge before entering the digester had extensive maintenance issues. Constant plugging, fouling, scaling, and the resulting lack in heat transfer led them to search for newer, more innovative solutions.

The Threemile digester required two heat exchanger solutions:

- A sludge to sludge heat exchanger that could transfer the heat from the 100 gpm 85 F effluent sludge stream leaving the digester to the cold, fresh incoming sludge (raising the temperature from 55°F to 67°F).
- A 350,000 Btu/hr sludge heat exchanger that could raise the temperature of a 100 gpm sludge stream from 67°F to 97°F using 100 gpm of hot water at 180°F on the shell side.

To meet Threemile Canyon's requirements, Komax proposed their patented Klean Wall™ Heat Exchanger. This robust sludge heat exchanger offers high efficiency and a maintenance free design that excels at processing high solids sludge.



Komax Klean Wall Heat Exchanger

The Klean Wall™ jacketed heat exchanger uses Hi-Pass™ technology to ensure the passage of large debris (up to 50% of pipe ID). The Hi-Pass™ technology also creates turbulent flow at the boundary wall which constantly scavenges the pipe and eliminates wall fouling. The resulting clean heat exchanger walls ensure high efficiency over the life of the heat exchanger.

For the sludge to sludge heat exchanger, Komax uses the Klean Wall™ principles with a non-clog spiral shell to further reduce energy costs.

Since installing the Klean Wall™ heat exchanger Threemile Canyon Farms hasn't had any plugging or fouling problems. Their digester began producing methane after only ten days. They plan on using the methane to heat water for use in the Dairy. In the event that the methane produced exceeds their requirement they will sell it off to a local power company at a profit.



After 10 days the digester began producing methane

