CASE STUDY:

Pleasantville, Iowa Wastewater Treatment Plant

EnviroMix

www.enviro-mix.com

Application:	Aerobic Sludge Digestion
Design Flow (ADF):	0.46 MGD
Mixing Efficiency:	0.3 HP/1000 FT^3 of tank volume at 4% WAS
Compressors:	One (1) 7.5 HP Rotary Screw
Blowers:	Three (3) 15 HP Positive Displacement
Design Engineer:	Snyder & Associates, Inc. – Ankeny, IA

During the anoxic cycle, the BioMix system provides energy efficient and uniform mixing of the sludge.

BioCycle-D™ Aerobic Digestion Process Delivers Plant 75% Energy Savings

Located in the gentle rolling hills of south-central Iowa, Pleasantville is a small community of less than 2,000 residents 25 miles southeast of Des Moines. Wastewater from the town is treated at the Pleasantville WWTP utilizing a sequencing batch reactor process. In accordance with Iowa's department of natural resources (DNR) discharge permit, the town needed to replace their storage lagoon waste sludge disposal system by 2024. In 2021, the plant started construction of an aerobic digestion process consisting of two 50,000-gallon tanks to stabilize the sludge for disposal off site by land application.

Alongside their design engineer, Pleasantville selected EnviroMix's BioCycle-D Optimized Aerobic Digestion Process because the technology provides ideal conditions for aerobic sludge digestion and the reduction of organic matter through endogenous respiration, maximizing volatile solids (VS) destruction, pathogen reduction and sludge conditioning at a fraction of the operations and maintenance expense of conventional aerobic digestion processes. **This made BioCycle-D the ideal choice for Pleasantville due to their unique design requirements and limited plant operations staffing characteristic of a small community.**

ENERGY EFFICIENCY

75% energy savings versus conventional state standards for aerated mixing

STRAIGHTFORWARD OPERATION

Automatically adjusts operation based on loading conditions

Minimal, localized maintenance

PROCESS OPTIMIZATION

Precise control of aerobic and anoxic cycles through instrumentation feedback

UNPARALLELED FLEXIBILITY

Uniform mixing at all operating levels with BioMix Compressed Gas Mixing System

Positive displacement blowers provide low pressure air for the fine bubble diffused aeration system.

"The EnviroMix team is always quick to respond and help me out. They're awesome to work with."

— Shawn Breazeale, Public Works Director

BioCycle-D conserves significant amounts of energy by decoupling aeration from mixing — the fine bubble diffused aeration system is right sized to supply the necessary oxygen for VS destruction while a separate, independent BioMix Compressed Gas Mixing System provides supplemental or independent mixing.

Under IDNR standards, aerobic digestion processes are required to be aerated and mixed at a specific diffused aeration volumetric airflow rate consistent with Ten States Standards. Given the long sludge retention time of the aerobic digesters designed to produce Class B sludge, the energy required by the standards was very high. By decoupling aeration from mixing, **BioCycle-D uses only one-quarter of the energy required by conventional aerated mixing.**

BioCycle-D utilizes a centralized control system that automatically manages the aerobic, anoxic, and sludge processing cycles of the system via instrumentation feedback. By regulating the aerobic phase of the process through dissolved oxygen (DO) feedback, optimized air delivery and effective digestion are achieved. By controlling the anoxic phase of the process through oxidation reduction potential (ORP) monitoring, BioCycle-D enables denitrification and alkalinity recovery without excessive phosphorus release to the digester supernatant. The process benefits of optimized digestion also result in improved sludge characteristics ideal for land application.

DO and ORP probes provide process feedback to control aerobic and anoxic cycle times.

Rotary screw compressor housed in a weathertight ventilated enclosure provides high pressure air for the BioMix system.

Contact sales@enviro-mix.com today to discuss the ways EnviroMix can optimize your mixing and process solutions.