



THERMAL PROCESS SYSTEMS

ThermAer™ Applications Report

Bowling Green, Ohio



2nd Generation ATAD Provides Superior Treatment at \$109/Dry Ton

Bowling Green, Ohio - The ThermAer process offers superior solids reduction and an odor-free operation. 2009 treatment costs were calculated at a remarkable \$109 per dry ton.

Bowling Green, Ohio, home of Bowling Green State University, installed Ohio's first, 2nd generation Autothermal Thermophilic Aerobic Digester (ATAD) in 2004. The expansion increased the plant capacity from 6 MGD to 10 MGD (15,400 ppd) to serve this growing community. The aerobic digesters had originally utilized a coarse-bubble aeration system which did a poor job of solids reduction, was a source of odors and was very energy-intensive. The ARCADIS-FPS initial analysis and design began as an improved "Class B" aerobic digestion, but was ultimately changed to the ATAD when further analysis identified the "Class A" TPS ThermAer as a major benefit for the plant and the community. Improved digestion, additional storage and the absence of odors were factored in to provide a win-win for all stakeholders.



Confidence in the TPS-ThermAer, you can count on it. The Thermal Process Systems ThermAer is located just across the street from the football stadium at Bowling Green State University in Bowling Green, Ohio. The initial concerns were alleviated after review of existing TPS systems was able to demonstrate successful ATAD operation with virtually no odor issues whatsoever.

Jet aeration in conjunction with ORP set points provide for independent control of the aeration and mixing intensity as well as optimization of the process reaction rate. The control panel is operator friendly and has the ability to conduct interactive training on the fly with recommendations for performance enhancements. The pasteurized biosolids are cooled and nitrified in a separate reactor to provide additional stability prior to land application.



A ThermAer Control Panel Display

ThermAer is high-temperature aerobic digestion that pasteurizes biosolids and produces superior mass reduction. The reactor is heated solely by heat released during aerobic metabolism of the waste solids.



Bowling Green Pump Gallery

Experience from earlier design and the local operating conditions at Bowling Green have resulted in several important design innovations. First, primary, screened septage and waste activated sludge flow to one of two ATAD reactors. The reactors, fed on alternate days, allow continuous sludge feeding and 24-hour isolation for pathogen kill. This innovation eliminated the need for a raw sludge storage tank, reducing construction costs. Second, the digested biosolids are transferred to a storage tank and cooled from 145°F to 95°F prior to their introduction to the Storage Nitrification/Denitrification Reactor (SNDR™). This part of the process reduces the ammonia from the ATAD reactors, improves settling and dewatering and controls biosolids' pH between 6.5 and 7.2. Third, treated biosolids are then transferred to storage tanks equipped with jet aeration, to produce a flocculent biomass that is very stable prior to centrifuge dewatering. Fourth, the nitrification tank acts as a prescrubber for the odor control system, removing ~60% of the ammonia found in the ATAD reactors before the BiofiltAer™, which reduces the overall biofilter size. These innovations reduce operating costs and produce quality biosolid material which is more valuable as a soil amendment, extremely stable and virtually odor-free.

"It is about as hands-free a biosolids system as I have used...we are consistently meeting permit."

*Douglas Clark
City of Bowling Green Water Pollution Control Superintendent*

ThermAer offers:

- Aerobic Process
- 50% TS Reduction
- ORP Process Control
- Quality Class 'A' Biosolids
- Odorless Solution
- Ability to Retrofit Existing Tanks
- 10 - 12 Day HRT

Installation of the 2nd generation ThermAer process along with the BiofiltAer odor control system with the Strobic fan ensures no odors are present onsite.

BiofiltAer with exhaust fan



The TPS ThermAer Process demonstrated the following results:

- ThermAer total solids reduction*: 72%
- BiofiltAer exhaust odors: None detected
- Energy savings (vs. conventional AD): 500 hp



Thermal Process Systems

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