



Customer Success Story

Customer Details



Client: Blairstown, IA

Location: Blairstown, IA

Application: BOD, TSS, and Ammonia Treatment

Product: LemTec™ Biological Treatment Process



About Our Customer/Problem

Blairstown is a quaint incorporated town in Benton County, Iowa. It is situated along Prairie Creek roughly 24 miles west of Cedar Rapids, the county seat. Blairstown is home to a population of 714, according to a recent census. The community features a diverse array of natural habitats, including lush forests, tranquil prairies, and meandering waterways.

These habitats provide a haven for a variety of wildlife, including white-tailed deer, turkeys, coyotes, and a variety of bird species. Additionally, several nearby lakes and rivers offer excellent fishing opportunities, making Blairstown a destination for anglers of all levels.

Nestled close to these rivers and lakes, this community was faced with a vital decision. Blairstown's aging wastewater treatment plant was nearing the end of its useful life and was no longer able to meet the needs of the growing community. The plant was originally built in the 1950s and had been expanded and upgraded several times over the years, but it was no longer able to adequately treat the wastewater to meet state and federal environmental standards. This was a major concern for the community, as it could lead to increased pollution of the nearby Cedar River and pose a health risk to residents and wildlife. The city reached out to Lemna Environmental Technologies (LET) to provide a solution to their complex problem.

Our Recommendation: LemTec™ Biological Treatment Process

LET suggested adopting the LemTec™ Biological Treatment Process (LBTP), an advanced solution that harnessed the facility's existing lagoons to manage treatment requirements and water flow. The proposed design for the Biological Treatment Process in Blairstown incorporated new Iowa Design Standards and utilized their two existing lagoons running in series to handle a total design flow of .62 MGD. The city's utilization of its existing lagoons vs. new construction resulted in a significant cost savings as well.

The first lagoon was a partial mix cell utilizing low levels of aeration and mixing to achieve BOD5 removal. Submerged high-rate diffusers were evenly distributed to achieve partial mix biological reaction rates as well as

maintain partial suspension of microorganism solids. In addition to BOD5 removal, ammonia was also removed by heterotrophic bacteria present in the cell.

The second lagoon was divided into two cells using Lemna's custom designed LemTec™ Reverse Miter Hydraulic Baffle to minimize short-circuiting with the first being a partial mix cell and the second a settling cell. The treatment system also included a LemTec™ Polishing Reactor located at the effluent end for additional BOD and ammonia treatment, providing effluent levels below 10 mg/l for BOD and TSS and as low as 1 mg/l for NH3-N. The Polishing Reactor with submerged attached growth media served as the final stage in the lagoon-based treatment process.

Design Parameters

Constituent	Influent	Effluent
BOD	46 mg/l	25 mg/l
TSS	37 mg/l	80 mg/l
NH3	7.2 mg/l	3 mg/l

Air Temperature	Celsius
Coldest Month	18.5° F

Results

The city personnel of Blirstown were extremely pleased with the dependable and cost-effective LET solution, which effectively resolved their wastewater concerns. The effluent data consistently met acceptable thresholds for BOD, TSS, and Ammonia levels, instilling trust in the community's discharge system and ensuring compliance with regulatory standards. The installation of the biological treatment lagoon system not only protected local natural resources but also set the stage for future population growth as well. The LET system addressed immediate concerns while positioning Blirstown for sustainable development, emphasizing both environmental stewardship and community well-being.

Data Results

