



Customer Success Story

Customer Details



Client: City of Elkhart

Location: Elkhart, IA

Application: BOD, TSS, and Ammonia Treatment

Product: LemTec™ Biological Treatment Process



About Our Customer/Problem

Nestled in the heart of central Iowa, Elkhart is a small town that seamlessly blends rural charm with a captivating natural environment. Its unassuming main street and tight-knit community provide a genuine backdrop to the lush, green landscapes that surround the town. Elkhart is home to many scenic trails and open spaces, inviting residents and visitors to explore the outdoors. The town's commitment to preserving its natural beauty is evident in its parks and recreational areas, offering a nice escape for those seeking the quiet allure of Midwestern living.

Over the last 15 years Elkhart's population has more than doubled. As a result of the growth, their wastewater

lagoon system had reached its capacity. In addition, the city received a NPDES permit from the Iowa Department of Natural Resources, requiring new stringent regulations in the effluent. In contemplating solutions for its aerated lagoon system, the city explored various alternatives, all of which necessitated a significantly larger system than the current one. However, due to the system's proximity to residential areas within 300 feet, the city council strongly opposed expanding the treatment system at its current location. The city reached out to Lemna to provide a solution to their complex problem.

Our Recommendation: LemTec™ Biological Treatment Process

As a strategic alternative, the city opted for a new site situated approximately one mile north of the city. Lemna designed a cutting-edge aerated lagoon system for their new site featuring two lagoons and incorporated our Biological Treatment Process technology. This innovative approach ensured compliance with BOD and ammonia nitrogen limits, allowing the city to meet regulatory requirements while avoiding the expansion of the treatment system near residential areas.

The Lemna design featured two parallel lagoons, each handling a total flow of 0.229 MGD, split equally between them.

These lagoons, with a depth of 12 feet, incorporate Lemna's custom-designed LemTec™ Reverse Miter Hydraulic Baffle to prevent short-circuiting between cells. Three partial mix cells in each lagoon utilized low-rate diffusers for optimal BOD5 and ammonia removal, while the fourth settling cell had a 4.0-day detention time. All cells were covered by Lemna's LemTec™ Modular Insulated Covers, promoting algae prevention and temperature regulation. Following the lagoons, the LemTec™ Polishing Reactor enhanced nitrification with submerged, attached-growth media modules. Aeration was provided by rack-mounted diffusers, producing effluent levels less than 10 mg/l for BOD and TSS and as low as 1 mg/l for NH3-N.

Design Parameters

Constituent	Influent	Effluent
BOD	131 mg/l	25 mg/l
TSS	157 mg/l	30 mg/l
NH3	24 mg/l	2.7 mg/l

Air Temperature	Fahrenheit
Coldest Month	21° F

Results

Elkhart's city personnel have found the Lemna solution to be very reliable and cost-effective in resolving wastewater issues. The system has consistently met acceptable thresholds for BOD, TSS, and Ammonia levels, ensuring compliance with regulations and building trust in the community's discharge system.

The biological treatment lagoon system not only protected local resources but also laid the groundwork for future population growth, addressing immediate concerns and emphasizing environmental responsibility and community well-being.

Data Results

