

Merry Lea Environmental Learning Center: Wastewater Treatment System

Wolf Lake, Indiana



top: Merry Lea Environmental Learning Center; bottom: Constructed wetlands

The Merry Lea Environmental Learning Center of Goshen College is located within a 1,150-acre nature preserve that includes northern Indiana ecosystems such as peat bogs, swamp maple forest, upland mesic forest, old field, prairie, and lakeshore. The Center houses Goshen College's expanding environmental science program and includes Rieth Village, where students can live near the ecosystems they study. The Center was

conceived and designed to meet the highest standards of the U.S. Green Building Council's LEED rating system. The Rieth Village is one of the first LEED Platinum projects in the state of Indiana.

A key member of the integrated design team, Biohabitats designed a wastewater treatment system that relied heavily upon constructed wetlands, a sand filter, and a trickling filter.

Primary Treatment at the site occurred in a septic tank. From there, water flowed first to a trickling filter where both Biochemical Oxygen Demand (BOD) and Total Suspended

Wastewater treatment system allows center to meet commitment that quality of water leaving the village be as close as possible to the quality it began with.

Solids (TSS) were reduced. The next step was an aerated lagoon that reduced BOD and also allowed for nitrification. Nitrification, denitrification, and BOD reduction were the result of constructed wetlands. Finally, the water travelled to a recirculating sand filter where nitrification, denitrification, TSS/solids filtration, natural disinfection, and BOD reduction occurred.

The cycle of nitrification and denitrification, crucial to the wastewater treatment process, is achieved at Merry Lea in Phase 1 by passing effluent through constructed wetlands and the recirculating sand filter. Including a trickling filter and an aerated lagoon in the treatment process enhances the nitrogen

cycle. The trickling filter and lagoon nitrify the effluent, which is subsequently denitrified as it passes through the wetlands. A similar process occurs within the sand filter, which provides final nitrogen reductions prior to disposal or reuse.

The treatment cycle is so effective that treated effluent can be reused on site for flushing toilets and irrigation. The system, which has become an important educational tool and an amenity for students, enabled Merry Lea to meet a commitment that water leaving the village be as close as possible to the quality it was when it entered the site.

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