

# Pine Haven Christian Home

## Project Information:

Client Name: Pine Haven Christian Home

Project Location: Sheboygan Falls, Wisconsin

Sustainable design techniques were utilized in the development of this former farm property into a senior residential community. Miller Engineers & Scientists provided environmental and geotechnical due diligence, surveying, and civil site design services, including a topographic survey and wetland delineation used to develop a conceptual plan that would minimize grading and make the most of the attractive and functional wetland and drainage swales.

The Phase I Environmental Site Assessment identified an underground storage tank requiring proper abandonment. A Phase II Environmental Site Assessment was subsequently coupled with the geotechnical investigation of the property. Petroleum contamination was confirmed and cost-effectively defined through a staged investigation.

Miller then completed a civil site design, incorporating walking paths and showcasing the natural beauty of the wetland. Rather than removing petroleum-contaminated soil to a landfill, Miller designed around the area of impacts, recommending that the soil stay in-place where contamination will degrade naturally. The contaminated area will be covered with impervious pavement to minimize leaching of petroleum to the groundwater.

Miller incorporated a biofiltration system with native plantings and vegetative filter around the site's detention pond to protect it from nutrient-rich agricultural run-off. Rain gardens are sprinkled throughout the site to provide color and surface water control. Other "green" site features include heat pumps that utilize the site detention pond to reduce heating and cooling costs, and recycling existing building foundations into crushed aggregate to be used on-site.



## Project Highlights:

- Comprehensive due diligence, including:
  - Phase I / II Environmental Site Assessments
  - Underground storage tank abandonment
  - Geotechnical exploration
  - Topographic surveying
  - Wetland delineation
- Civil site design, including:
  - Naturalized stormwater management, including biofiltration systems, vegetative filters, and rain gardens
  - Walking paths for connectivity
  - Sustainable site design to protect and showcase site's natural features
- Geothermal heat pump design incorporated into detention pond design for improved effectiveness and efficiency

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