

XCEL SHERCO, MINNESOTA

Meeting stringent CCR regulations with BENTOLINER



Industry: Energy
Sub-industry: Coal
Location: Minnesota
Product: **BENTOLINER®**

Overview

In 2020, Xcel Energy faced a fast-approaching deadline to close Sherco Pond No.1, a large coal combustion residuals

Due to the aggressive nature of the ash leachate, a standard bentonite GCL would not meet the permeability requirements of the project.

(CCR) pond in Becker, Minnesota. To maintain continuous service to the energy plant, Xcel Energy had to construct a second pond.

The new Sherco Pond No.2 would need to meet newer, more stringent CCR storage regulations and requirements than its predecessor.

Challenge

To meet the new regulations and to fulfill the Minnesota Department of Natural Resources requirements, the project required excavation and movement of 458,733 m³ (600,000 yd³) of soil, while also addressing various environmental and wildlife sensitivities.

The challenge was to find a readily available product, that could be installed quickly and meet the performance permeability metric of 1.03 x 10⁻⁹ cm/sec. To meet these requirements, the engineers at Carlson McCain chose Solmax to supply geosynthetic clay liners (GCL).

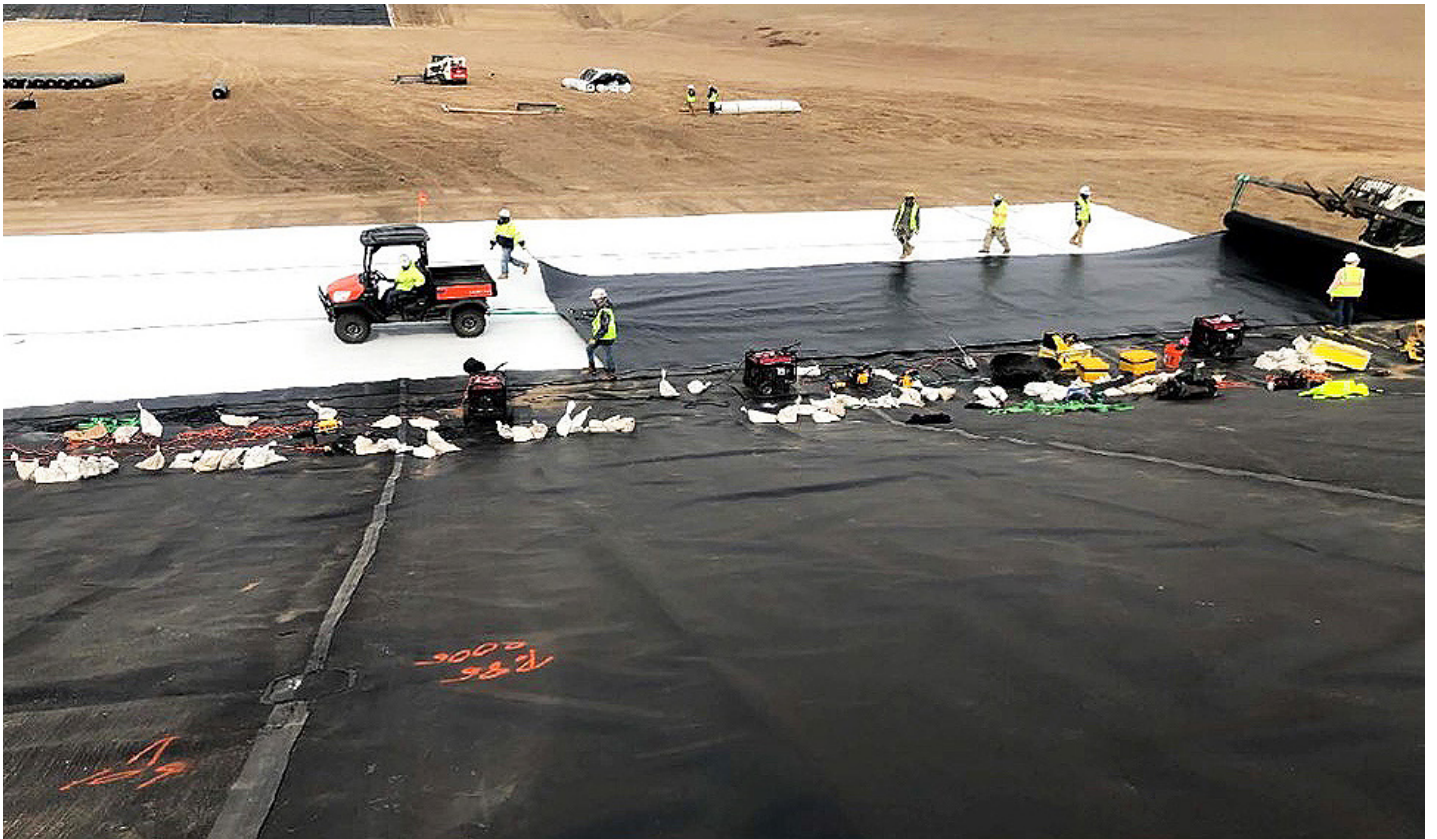
CASE STUDY

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Solution

Due to the aggressive nature of the ash leachate, a standard bentonite GCL would not meet the permeability requirements of the project. The project required a polymer enhanced product and proof that the GCL would meet the regulatory requirements for permeability.

Dr Craig Benson conducted hydraulic conductivity testing following ASTM D6766 on **BENTOLINER** Coal Ash Resistant (CAR) polymer-enhanced GCL to test the compatibility with the Xcel Sherco bottom ash leachate. Testing results concluded that the hydraulic conductivity of the **BENTOLINER** CAR was 8.3×10^{-10} cm/sec. The samples had successfully reached hydraulic and chemical equilibrium with the leachate, meeting the new CCR storage regulations. The testing and proof of performance on the **BENTOLINER** CAR in the harsh environment played a crucial role in the success of the project. The work was completed in time to maintain continuous service with minimal impact on the environment. The latest and most stringent CCR regulations were also met for the new landfill.



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