

ESSAKANE GOLD MINE

Restoring raw water supply



Industry: Water Management
Application: Reservoirs and Ponds
Location: Burkina Faso, Africa

Overview

In 2008, IAMGOLD acquired the Essakane Gold Mine in Burkina Faso, Africa, and quickly implemented mine, plant and support infrastructure. The plant process water was obtained from storage basins built from easily accessible, low permeability sparolite (clay) material.

Operators soon discovered that the potential for seepage in the storage basins was higher than previously foreseen, which could hinder the mine's ability to meet production targets. Taking into consideration future expansion plans, IAMGOLD Engineering and Construction determined the best strategy would be to build a new reservoir, bulk water storage (BWS) 3, to add capacity. Once BWS 3 was operational, the two existing reservoirs (BWS 1 and 2) would be lined to ensure a sufficient raw water supply.

Challenge

Studies showed that underperforming clay as a sole barrier could cause the reservoirs to lose water. To address this issue, engineers designed a composite barrier consisting of low permeability local clay installed over a saprolite base, followed by a 2.5 mm (0.1 in) thick white HDPE geomembrane as the primary barrier.

1. The designers specified 2.5 mm (0.1 in) white HDPE geomembrane for two reasons:
 1. The light color helps prevent desiccation of clay liners, and white liners have a lower wave build up.

The white surface reflects UV radiation, the liner temperature stays lower. This would allow the welding and installation to proceed uninterrupted, even in the hot Burkina Faso climate.

After researching their options, engineers chose Solmax's GSE® HDPE White Geomembrane due to its proven track record of UV stability under similar conditions.

CASE STUDY

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Solution

Solmax manufactured and supplied nearly 700,000 m² (7.5 million ft²) of GSE HD White HDPE geomembrane over the course of the three-year project. In addition, Solmax's experienced engineers provided technical assistance during the design and installation phases of the project.

The entire project was completed in the fourth quarter of 2012. The installation schedule was tight, and the construction crew faced many challenges. Burkina Faso has a rainy season from June to September and in order to maximize the pond's capacity, BWS 3 needed to be completed prior to the rainy

season. This requirement reduced the installation period to just eight weeks.

Although BWS 2 was constructed during the rainy season, it was successfully completed on time. By the time construction began on BWS 1, the installation crew was so familiar with every aspect of the work that they completed the reservoir ahead of schedule.

The installation of a properly engineered composite barrier solved the water loss issue and increased the holding capacity of the three ponds.



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