

First Use of a Geosynthetic Clay Liner (GCL) in a Copper Heap Leach Pad

The Carlota Copper mine is an open-pit copper mine located approximately six miles west of Miami, Arizona. The site produces LME grade copper cathode through the process of heap leaching, in which a chemical solution is irrigated through heaps of ore, dissolving the precious metal. The resulting copper-infused liquid (aka the pregnant leach solution) trickles down to a leach pad, where it is collected and pumped to a recovery facility. In order to prevent the pregnant leach solution from leaking out, the leach pads are typically comprised of a composite liner system with a geomembrane overlying a low permeability soil layer.



PROJECT DETAILS

Carlota Copper Mine Heap Leach Pad

LOCATION

Globe Miami, AZ

PRODUCTS USED

BENTOMAT® DN GCL

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CHALLENGE:

The weight and mass of the heap pile at the site challenged the ability of a single geomembrane liner to provide an effective barrier for the leach pad. In addition, access to clay on-site was severely limited due to location. Slopes as steep as 2H:1V further compounded the situation. Moreover, time was tight as a result of a delayed start to the project. Finally, as if these challenges were not enough, a massive storm hit two days after the lining contractor arrived on site.

SOLUTION:

The decision was made to use a BENTOMAT® DN GCL, which allowed engineers to overcome several of their obstacles. The geotextiles that are used to produce BENTOMAT DN GCLs yield a final product that provides high internal and interface shear strength that could meet the strenuous slope requirements of the project. The cushioning effect of the GCL also resulted in less puncture damage from the crushed ore placed on top of the geomembrane.

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The use of a GCL allowed for a much faster, easier, and lower cost installation than trucking clay from off-site locations (one truckload of BENTOMAT® DN GCL is approximately equivalent to 150 trucks of clay) and was able to withstand the adverse weather conditions.

RESULT:

The use of a GCL/geomembrane composite liner system decreased the amount of leach solution lost to leakage, thereby improving copper recovery rates and providing the company a greater return on investment. All work was completed on-time.