

EUROPE'S LARGEST NICKEL MINE, FINLAND

A successful solution for contaminated water management



Industry: Mining
Sub-industry: Waste
Location: Finland
Product: **GEOTUBE®**, **GSE® HD**

Overview

Europe's largest nickel mine located in northeast Finland, faced significant challenges in managing water contaminated by sulfates and heavy metals. The issues stemmed from excessive rainfall leading to water storage, contamination of rainwater by mining activities, and leakage from a tailings pond containing gypsum sediment. These challenges jeopardized the mine's operations and required an effective solution to ensure environmental compliance and financial feasibility.

Challenge

In 2012, the mine encountered several water-related challenges. Excessive rainfall forced the mine to store millions of cubic

meters (tens of millions of cubic feet) of water on-site, leading to contamination from mining activities. Additionally, high levels of contaminated water accumulated in the deepest part of the open-cast mine, forcing a temporary halt in ore mining operations. In November, a tailings pond leak released approximately 220,000 m³ (7.8 million ft³) of effluent containing metals and sulfate compounds. These challenges, combined with the vast 61 km² (23.5 mi²) mine area, necessitated a cost-effective and efficient water management solution.

The treatment of sludge and mining effluent using GEOTUBE technology significantly reduced heavy metal concentrations, well below local environmental authority limits.

CASE STUDY

A successful solution for contaminated water management

Solution

To address the water contamination issues, a comprehensive solution was implemented in 2013. The solution involved the use of 13.7 m (45 ft) wide and 50.7 m (166 ft) long **GEOTUBE** containers installed on a 1.5 mm (60 mil) smooth **GSE HD** geomembrane to capture heavy metals from the contaminated water. The project benefited from the collaboration of various experts, including site management, a dedicated team of Solmax dewatering professionals, specialized engineering partners and a contractor with expertise in using Watermaster environmental dredges in conjunction with **GEOTUBE** technology.

The cleanup operation commenced in March 2013, exceeding expectations from the outset. The treatment of sludge and mining effluent using **GEOTUBE** technology significantly reduced heavy metal concentrations, well below local environmental authority limits. Consequently, ore mining and crushing operations resumed in May 2013, ensuring the normal functioning of all four production areas within the mine. The mined ore also played a vital role in maintaining the site's water balance by binding millions of tonnes of water in the leaching area. This successful solution demonstrates the effectiveness of **GEOTUBE** technology in addressing large and complex mine wastewater management challenges.



Solmax is not a design or engineering professional and has not performed any such design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation, or specification.

Products mentioned are registered trademarks of Solmax in many countries of the world.