



Case Study

Unique Mine and Process: High Efficiency with Bioleaching and adapted Filtration

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Finland is currently witnessing several mine site establishments as the traditional industry strengthens its position within the Nordic countries. Talvivaara Mine is a great example of how alternative mining methods can be economical and how determination and cooperation can spur entry into the global mining markets, sustainably and cost effectively.

Talvivaara is a relatively new, large scale open pit mine project in the north of Finland southeast from city of Kajaani. Talvivaara's mineral resource is 1550 million tonnes with 1121 million tonnes (72 per cent) in measured and indicated categories. The mined ore is further processed to nickel-cobalt sulfide, zinc sulfide and copper sulfide. The ore body is estimated to support anticipated production for several decades.

The entire project has moved on quickly, considering the Talvivaara company was established in 2003, and the mining concessions and exploration and research data were gained in 2004. In 2005 a 17 000 tonne on site bioheapleaching trial was conducted, and an environmental permit was received in early 2007.

In 2006 Outotec (Larox at the time) was asked to quote for filters for the Talvivaara mine for zinc and nickel processing using the bioleaching method. The deal between Outotec and Talvivaara was closed in 2007, and at that time it was

the largest single order in Larox History (now Outotec). In winter 2007 the pilot heap was reclaimed and the secondary leaching phase began. Mining of ore was started in 2008, and the first delivery of nickel product to Norilsk Nickel in Harjvalta was completed in February 2009.