1 ABSTRACT

Salinen Austria AG is a salt producing company with headquarters in Bad Ischl, Austria. Salt has been mined and produced in the region for centuries. The mining method used in the underground mines of Altaussee, Hallstatt and Bad Ischl is solution mining. In addition, the company has been operating a brine field with about 17 wells in Sulzbach in the south of Bad Ischl since the late 60ies.

Currently, all these mining operations yield a total of approximately 3,000,000 m³ of brine. 25% of this quantity are delivered to Solvay Company in Ebensee and 75% are evaporated to produce salt in the Ebensee evaporation plant of Salinen Austria AG.

Because of the chemistry of the alpine salt formations called „Haselgebirge“ relatively high quantities of tailings are produced in the course of brine purification in Ebensee. Up to this point, these inert tailings have been disposed of under water in lake „Traunsee“. A change in production capacity of the evaporation plant and in the related legal situation have made it necessary for the company to search for new ways of disposal or prevention of brine purification tailings.

In 2001, a plant was built on the Sulzbach brine field for the disposal of tailings in caverns. Currently, part of the tailings are already transported to the caverns by truck for disposal. A pipeline is under construction in order to replace transport by truck in future.

”Haselgebirge“ is a geological salt formation with an average of 50-70 vol.% of NaCl in the deposits of our region. The remaining insoluble components cause relatively small caverns during and after operation. The current mining strategy on the brine field guarantees an equilibrium between free disposal volume and the expected volume of tailings to be deposited.

Salinen Austria AG started a program to investigate the possibilities for reducing the amount of brine purification tailings at the Ebensee plant. Brine purification is performed discontinuously by the so called ”Schweizerhalle” process. In this process, precipitation of $Mg(OH)_2$, $CaSO_4 \cdot H_2O$ and $CaCO_3$ is achieved by adding $Ca(OH)_2$, CO_2 and $NaCO_3$. The idea of in-situ brine purification consisted in transferring part of the above-mentioned process to the cavern. $Ca(OH)_2$ was added to the leaching water in order to achieve precipitation of $Mg(OH)_2$ and $CaSO_4 \cdot H_2O$ in the cavern.

The installed test equipment consists of a silo for CaO, a screw conveyor, a differential dosing screw, a mixing tank with stirrer, a pump, and a pipeline to the cavern approx. 1.4 km away.

After one year of experience with the large-scale field test at Salinen Austria AG we can say that we have achieved a brine quality in test operation which might decrease the amount of brine purification tailings at the Ebensee operations by a relevant proportion. But there are still some problems to be solved before implementing in-situ brine purification for actual field operation.