



SIKA AT WORK

SWEDISH MASTER CLASS

PARTNERING WITH ONE OF THE WORLD'S MOST EFFICIENT MINING OPERATION

BUILDING TRUST



THE BOLIDEN GARPENBERG MINE

PROJECT DESCRIPTION

The Garpenberg Mine, owned and operated by the Swedish mining company Boliden, is located in middle Sweden in the so called Bergslagen area, home to a number of polymetallic VMS and SEDEX deposits. Earliest mining records of the Garpenberg deposits date back to 1200 making it one of the oldest mining camps globally. Boliden is involved with the Garpenberg operation since 60 years. The world class deposit is a typical VMS type locality and exceptional in terms of size, ore quality and grade with a long life of mine ahead. The Boliden Garpenberg operation is widely seen as one of the most automatised and efficient underground mining operation on the globe. This is mainly due to a very skilled and efficient work-force, high degree of automation and a recently completed expansion project, taking the ore throughput from 1.4 to 2.4 milion tons per year.

- 1 Front: Shotcrete application at the Garpenberg Lappberget ore body
- 2 The new Garpenberg Norra industrial site including the ore concentrator, new shaft, electrical sub-station and the paste plant (Source Boliden AB)
- 3/4 Discussing shotcrete application with the Boliden Nozzlemen and technical personnel
- 5 Long section of the northern Garpenberg Mine area (source Boliden)
- 6 Incycle shotcreting underground
- 7 Testing early strength development of the freshly sprayed concrete
- 8 The Garpenberg South Shaft on a crisp winter morning

EFFICIENT UNDERGROUND DEVELOPMENT WITH SIKA

Sika is very proud to be part of this mining master class. The Sika Sweden mining team started to collaborate with the Garpenberg operation almost 20 years ago and got strongly involved at the very beginning of the most recent expansion project, assisting upgrading the in cycle shotcrete support in order to facilitate rapid mine development, providing early re-entry times to the freshly blasted and secured production and development headings. Special concrete designs and application methods were used to line the newly sunken shafts, ore passes and raises and to install the large, new ore concentration facility at the Garpenberg Norra location. In order to elaborate the best cost performing shotcrete mix design, the Sika MiniShot tool was playing a crucial role to screen through different mix designs and customize the shotcrete admixtures to the local requirements. Based on these results, Boliden performed a detailed selection process of the concrete and shotcrete admixtures with view towards the optimal cost performance for the Garpenberg operation and for its other Swedish mining operations.

Today, Sika supplies not only the Boliden Garpenberg mine with underground construction chemicals and supplies but also the Bolidens Renström and Kristineberg operations in northern Sweden and the Boliden Tara mine in Ireland. Sika has become a well respected partner of the different mine sites.



2

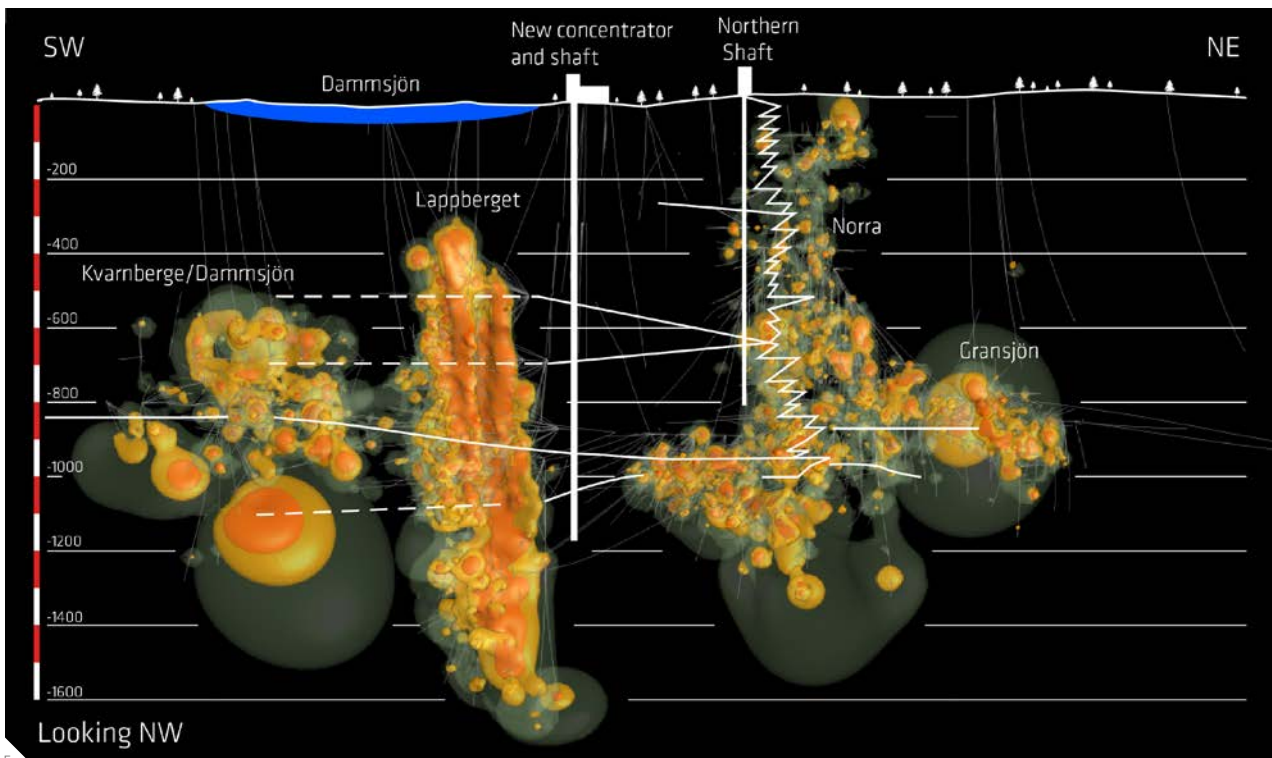
PROJECT REQUIREMENTS

Sprayed concrete

- Rapid early strength development 4Mpa in 4 hours
- High final strength
- Easy bulk handling of shotcrete admixtures
- Open time >4h
- High energy absorption of the shotcrete liner
- High abrasion resistance of ore pass liners
- Fast response and high level of technical support

SIKA SOLUTION

For the underground support of the development headings, drifts and stopes, Sika Sigunit® in combination with Sika® ViscoCrete® EVO 36S are used to provide high early strength for fast re-entry times and required workability times.



THE BOLIDEN GARPENBERG MINE



SELECTION OF SIKA PRODUCTS

- Sika® ViscoCrete® EVO 36S Customized superplasticizer for the local Garpenberg concrete requirements
- SikaTard®-932 Hydration stabilizer
- Sigunit® L2712 AF Alkali-free, high performance shotcrete accelerator

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



SIKA SERVICES AG
 Tueffenwies 16
 CH-8048 Zurich
 Switzerland

Contact
 Phone +41 58 436 40 40
 www.sika.com

