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## STRESSES IN IRON ORE PELLETS DURING SILO DISCHARGE - ANALYSIS IN LARGE STORAGE SILOS WITH PERFORATED INNER TUBE DESIGN

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### Report

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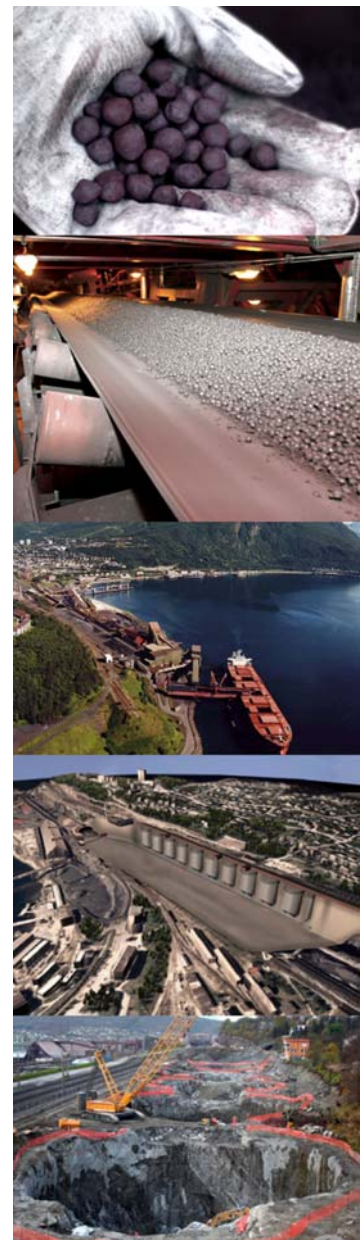


### Background

In the north of Sweden the state owned company LKAB is increasing their production. Their main product is sintered iron ore spheres called pellets. The pellets are mostly shipped by boat from the harbor of Narvik in Norway to costumers all over the world. In Narvik the storage capacity is required to expand because of the ratio between the cargo capacity of trains and of the ships. To meet the demands twelve giant silos are built in the bedrock, each with a diameter of 40 m and a height of about 60 m. The pellets are not allowed to reach a certain limit of stress in risk of cracking and loss of permeability. The permeability is an important property of the pulp for the steel plants. The following process in the plants includes warming which can be done with hot air that will be opposed by too many fines. The silos have a perforated inner tube design to decrease the stress in the pellets.

### Contents

The thesis will be about the stresses in the iron ore pellets during discharge of these large silos. The work will be executed with numerical methods and with the entire volume of pellets modeled as a continuum. To obtain accurate results of stresses the calculations will be transferred and evaluated in a control volume with pellets as deformable bodies.



By courtesy of LKAB