ABSTRACT

In this work a general introduction is carried out as background, to the study of the process of compaction suffered by the residues of salt, due to its own weight, from its placement in a tailing dam, on the basis of bibliographical updated information.

The aim of this graduation thesis is the evaluation of the stability of tailing dam of salt considering the creep response of this material.

Due to the confinement, the water presence and the self weight of the material, the grains of salt suffer a process of dissolution and recrystallization similar to cementation that increases the resistance of the salt.

The work investigates the influence of this phenomenon, with regard to the stability of the slopes of the saline tailings by means of a numerical model. For it has been used the program Code_Bright_GiD a program developed in the Geotechnical and Geosciences Department that basically connects the mechanical, hydraulic and thermal problem in the geological way using the method of finite elements.

The study of the stability of the tailing dams distinguishes the crushed salt and the slurry behind. The problem has been analyzed by means of finite elements for different schemes of storage: for example saline caps inclined towards both sides, provided that this geometry is the one that more would adjust to the method of work in a tailing dam. Other schemes have also been investigated.

Different assumptions of work have been considered. First it has been considered to be the break in undrained conditions, provided that it is the most conservative, and has been applied to the different schemes and for different values of undrained shear strength (c_u = 30, 40, 50 kPa). Secondly, the problem has been studied considering it fully drained. This case is interesting since it allows analyzing the consequences of the consolidation of the slurries.

Finally, some calculations have been realized in coupled conditions that is with drainage but limited by the permeability of the slurry. To analyze the influence of the time they have been considered to be three different time scales.