RISKS OF SEVERE DROUGHT IN THE CHILEAN MINING INDUSTRY

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ABSTRACT

Annual rainfall is very variable in Chile's Central Zone. Historically the region has been seriously affected by frequent/ prolonged periods of drought, whose length of time can vary from 2 to 11 or even 13 years.

The mining industry in Chile has been hit hard by severe draught. Should extreme drought occur in the near future, the economical effects may be devastating.

Existing and new mining production, along with its corresponding water consumption, are analysed in this paper. A number of technical measures to reduce or avoid the damage of future extreme drought are presented. The measures proposed are technically feasible, but their high costs are predicted. At this stage of the research work, no financial calculations have been done nor have comparisons been made.

INTRODUCTION

There are many definitions of "drought". A drought is commonly defined as "an extended period of time with deficient rainfall relative to the situation of the statistical average time average for a region [1]". Despite the large quantity of water existing on the Earth [2] (about 1,400 million m^3), only a very limited amount is available as fresh water (2.6%) and only very little of this water can serve as a resource to meet human demand.

Taking the limited amount of water resources available and the high variability (spatial and temporal) of rain and flowing streams, into account, both the common drought, and even the extreme drought, are rather frequent. Furthermore, their effects can be catastrophic and may affect all the life of a region. For example [2]: (a) US losses due to the 1988 drought, exceeded $40 billion (more than Hurricane Andrew in 1992, or the Mississippi River floods in 1993, or the San Francisco