

A TWO-COMPONENT BARRIER SYSTEM TO PROTECT COASTAL REGIONS FROM THE RISING SEA LEVELS

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Abstract

Global warming is expected to result in the rising of sea levels. Should this occur, coastal cities, ports, and would be threatened with more frequent inundation, increased beach erosion, and saline water encroachment coastal aquifers. The purpose of this paper is to present one possible mitigation methodology to protect the sea shores of Egypt and limit the sea water infiltration into the sand aquifer along the Mediterranean Sea. A finite element model, using Z-Soil finite element analysis program, was used to analyze the proposed underground impervious cut-off wall. Studies were undertaken of the main factors which affect the head losses through wall to optimize its dimensions. In case of a 1-m rise in the sea level, the numerical model represented the solution with its two-component protection. PVC sheet pile embedded into an oil-cement-bypass-bentonite cut-off wall provides a two-component barrier system. The proposed solution succeeded in providing a top barrier in addition to complete blockage of the subsurface seeping water.