Projet d'Ingénierie 2015 – 2016 (10h)

Ecole Nationale Supérieure de l'Energie, l'Eau et l'Environnement
Filière : Hydraulique Ouvrages et Environnement.

Impact Study of an Underground Structure on Groundwater Flows : A Methodological Approach.

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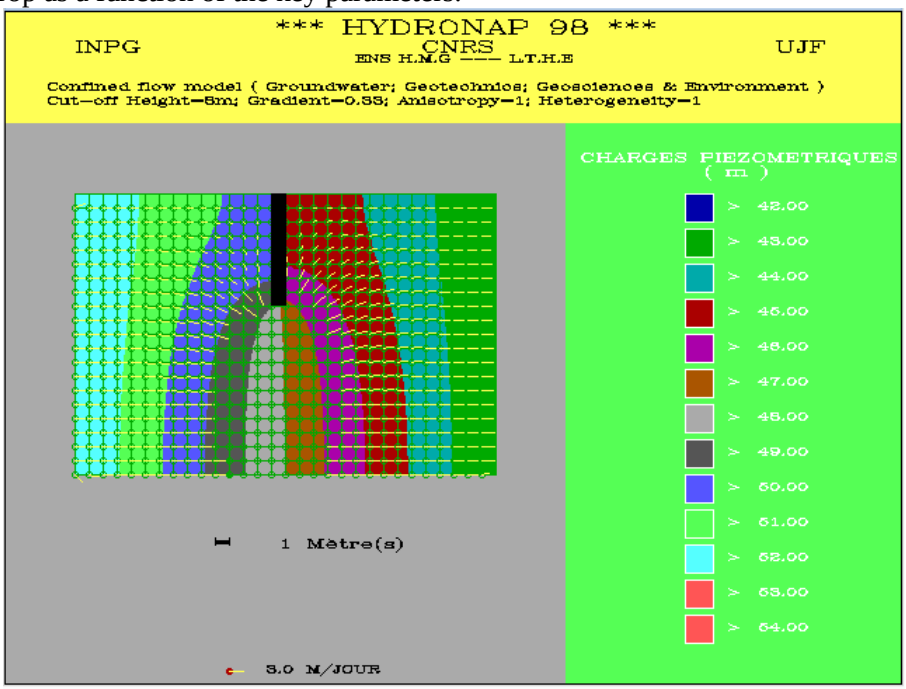
R. WOUMENI (subject n°3)

More generally, structures like tunnels, covered trenches, car parks and other underground cavities, produce the an effect on groundwater level, with some environmental impacts (an increase of runoff upstream, sometimes a collapse of buildings downstream) which need to be reduced as far as possible. The objective of this project is to perform a methodological study to identify the influence of some key parameters, on the hydraulic impacts of geotechnical structures. In a first analyze, we will consider that the hydraulic head drop between upstream and downstream of an underground structure, is a function of the following parameters: hydraulic gradient, cut-off ratio, anisotropy of the soil, the degree of soil homogeneity, and type of the groundwater flow : confined or unconfined. The hydraulic head drop will be seen as a rough assessment of the impact of the underground structure, on the native groundwater flow. We will use the numerical code Hydronap 98 of WOUMENI, to calculate the hydraulic head drop as a function of the key parameters.



Results for an underground structure with the Software Hydronap 98.