Høgskolen i Sørøst-Norge

Exam

4324

Georesources and groundwater

26.04.2016

Tid/Time:	4 timer/hours (9-13)
Målform/Language:	Engelsk/English
Sidetal/Pages:	2 (inkludert denne/including this page)
Hjelpemiddel/Aid:	None
Merknader/Special remarks:	None

Vedlegg/Number of attachment: None

Sensuren blir offentliggjort på studentweb

The results will be published on Studentweb.

Problem 1

a. What kind of subaquatic deposits are expected to be found in front of a glacier? Make map sketches and vertical cross sections.
b. What grain size distributions and values of hydraulic conductivity K will there be for the different deposits you find in this environment?
c. With a river running through such deposits locate a high capacity groundwater well. Argue for your solution.

Problem 2

Ground penetrating radar (GPR) is a useful tool for subsurface surveys.

a. Describe the components of GPR equipment and the physical principles of GPR.
b. Make a typical GPR profile from a glacier front environment, with a description of the different patterns and sedimentary features.
   Draw and explain how patterns of inclination of layers, layer surfaces, boulders, bedrock outcrops and bedrock surface may appear on a GPR profile.
c. How can we apply a GPR for location of a high capacity groundwater well?

Problem 3

a. A walk in the field, or a field survey, is always necessary before any action in the field. How will you do that?
b. Make a conceptual model of an aquifer with the three types of boundaries, recharge/discharge, and properties. Describe the boundaries and properties.
c. Place a finite difference grid on a map scetch with the boundaries and properties. Discuss a proper cell size.
d. How can you determine the watershed, and what impact has the watershed runoff on the aquifer?
e. What is the product of a finite difference flow model? How is the finite difference solution for calculation of this parameter?

Problem 4

a. Draw a cross section of marine clay with a quick clay layer.
b. Where on Earth do we find quick clay?
c. Describe the development of quick clay over time.
d. What are the most common causes for soil landslides?
e. What can we do to prevent soil landslides?