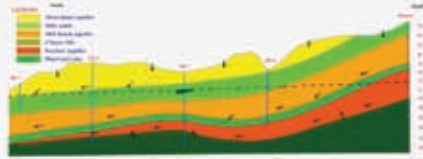




Training Course -20-24 March 2010

TECHNOLOGY EXPERTS
GLOBAL EXPERTS GROUP

Assessment of Water Resources Using Groundwater Mathematical Modeling (Level I)



The beneficiaries of this training course:

This course would be of interest to the Engineers, Hydrogeologist and Geologist who are interested in advancing their modeling knowledge, and apply finite differences and finite elements, using different software, to more complex modeling designs.

When do I register?

Registration ends one week before the beginning of the training course due to limitation of seats.

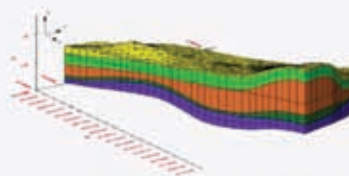
Course costs

The cost of the training course is 4500 (SR) per person and will be reduced to 4000 when more persons from one institute are registered.

Bank Transfer: National Commercial Bank,
Account No. 26552900000103.
IBAN SA8210000026552900000103

Contact Us:

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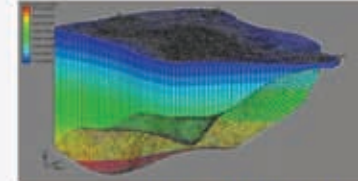
Course Objectives

Upon completion of the course, you will learn:

- Approaches to conceptualizing complex flow problems
- Create conceptual models using GIS objects
- Learn to characterize water flow in both 2D and 3D.
- Fundamentals of building 3D model in finite element software.
- Applications of finite element and difference in unsaturated zone flow, density-dependent transport.
- Perform differences between flow modeling with finite differences and finite elements.
- How to calibrate your finite element flow model
- Learn how to generate professional output of modeling projects.
- Parameter Estimation

Course Description

The groundwater modeling training course by Technology Experts is designed as a hands-on, application oriented training course. The course will provide the attendees with the knowledge and tools necessary to solve groundwater modeling problems quickly and efficiently. The course will begin with a discussion on how to use the geostatistical tools to characterize aquifer system building in 2D and 3D and water flow. A series of tutorials and lessons will then be given including an explanation of how to use the Map Module to create numerical models directly from a high-level conceptual model constructed with GIS tools. Analytic element modeling will also be covered.



Course Schedule

Day 1:

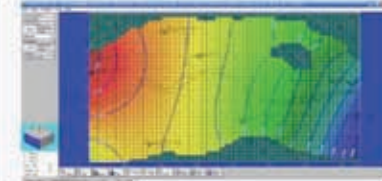
Groundwater Modeling Concepts
Conceptual Model Development
Selecting Boundary Conditions
2D vs. 3D
Steady State vs. Transient
Code Selection
Model Calibration
Prediction

Day 2:

Getting Started on a Modeling Project
Setting up a coordinate system
Selecting Units
Defining a base map
Importing images
Constructing a conceptual model
Conceptual model objects
Coverages
Feature objects
Analytic Element Models – MODFLOW
Introduction to the analytic element method
Benefits/limitations of MODFLOW modeling
Setting up a MODFLOW model

Day 3:

2D Geostatistics
2D Scatter point module
Interpolation methods
3D Geostatistics
Site Characterization
Borehole data
User-defined cross-sections
MODFLOW – Part I
Overview
Basic, Recharge, Well, Drain, Solver Packages
Grid-based pre-processing
Model Checker
Launching MODFLOW
Post-processing



Day 4:

MODFLOW – Part II
Stream-Aquifer Interaction
General Head
Changing Head Boundary
Horizontal Flow Barrier
MODFLOW – Interpolating Layer
Elevations Interpolation from scatter points
Site Characterization via Horizons
Horizons Solids
MODFLOW Conceptual Model Approach
Strategies
MODFLOW Coverage Setup
Importing GIS Data
GIS Module
Shape files

Day 5:

MODFLOW
Applications of modeling
Setting up the input
Output Options
Calibration Tools
Calibration basics
Importing Observation Well Data
Observation coverage
Point Observations
Flux Observations
Plotting calibration statistics
Parameter Estimation
Introduction to inverse modeling
Parameterization
Defining zones with key values
Parameter Estimation
Pilot point method
Regularization
Pilot point placement

