



Oak Environmental Inc.

Environmental

Geotechnical

Hydrogeological

Oak Environmental presents a one-day short course for groundwater professionals

Critical Thinking in Aquifer Test Interpretation

Instructor: Christopher J. Neville - S.S. Papadopoulos & Associates, Inc.

Date: Friday November 21st, 2014

Location: Blackfoot Inn, 5940 Blackfoot Trail SE, Calgary, Alberta

1. Course motivation

It is not possible to exaggerate the importance of reliable interpretations of aquifer tests in groundwater applications. Reliable interpretations are essential for evaluating groundwater resources and predicting the effects of developing additional groundwater supplies, delineating wellhead protection areas, evaluating the migration of solutes and designing remedial measures at contaminated sites. Aquifer tests are generally interpreted using methods based on highly idealized conceptual models of the subsurface. The theory of these methods and their application in simple settings are treated well in several excellent textbooks and monographs. However, more often than not, when a hydrogeologist is charged with interpreting the results of an aquifer test he/she often discovers that the data do not look like those in a textbook. Data are typically noisy, do not approximate theoretical type curves, and frequently yield inconsistent estimates of aquifer properties. This one-day short course is designed to assist in bridging the gap between theory and practice. The objective of the course is to hone the critical thinking skills of practicing groundwater professionals responsible for interpreting data from aquifer tests in natural complex settings.

2. Course description

The course is structured as a set of formal lectures that include coverage of the underlying theory with extensive discussion of case studies. The course takes a rigorous yet practical approach, focusing on two key aspects of interpretation: the diagnosis of aquifer response, and the estimation of representative aquifer properties.

The lectures and discussion are designed to go beyond the nuts-and-bolts of aquifer test interpretation and address concepts of diagnosis of aquifer response and assessment of the reliability of parameter estimates. The course is not devoted to any particular computer-assisted interpretation package, but such methods will be used to demonstrate some of the concepts.

Attendees will be provided with comprehensive, detailed course notes. These notes are intended to be formal technical documents that will serve for subsequent self-study. In

addition, copies of the course slides and accompanying papers will be made available for attendees.

Discussion will be encouraged.

3. Instructor

Mr. Christopher J. Neville, M.Sc., P.Eng. is the developer and instructor of the course. Mr. Neville is a Senior Hydrogeologist and Associate with S.S. Papadopulos & Associates, Inc. in Waterloo, Ontario. He was trained as a civil engineer and hydrogeologist and has over twenty years of experience in solving groundwater problems. His specialization is in the interpretation of hydrogeologic data, and the development and application of analytical and numerical techniques to analyze groundwater problems in complex granular and fractured porous media.

Starting in 2004, Mr. Neville has taught this course over 25 times, four of those times at the annual joint conference of the Canadian Geotechnical Society and International Association of Hydrogeologists – Canadian National Chapter.

4. Syllabus

The course begins with a detailed discussion of the interpretation of slug tests. The discussion includes case studies that feature departures from conventional cases, including underdamped responses, testing wells with skins, and partially submerged well screens. The course then moves on to discussion of the foundations of pumping test analysis, including a case study on how pumping tests should not be interpreted. Specific lectures are devoted to Derivative Analysis, the interpretation of pumping tests in aquifers with linear boundaries, the significance and interpretation of recovery data; and the interpretation of drawdowns from pumping wells. The course is concluded with a discussion of steps that can be taken to maximize the reliability of aquifer test interpretations.

Outline

1. Interpretation of slug tests
2. Foundations of aquifer test analysis
3. Introduction to Derivative Analysis
4. Interpretation of pumping tests in bounded aquifers
5. The significance and interpretation of recovery data
6. Interpretation of pumping well drawdowns
7. Case studies of pumping tests
8. Guidance materials for pumping test interpreters
9. Key reference materials

5. Course registration fees

Registration fee is \$ 495.00 plus GST.

IAH and CGS member registration fee is \$ 445.00 plus GST.

Student registration fee is \$ 125.00 plus GST.

Fees include registration to attend course, course note binder and refreshments/snacks.

Lunch will be provided.

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6. Schedule

The preliminary course schedule will have registration from 8:00 am to 8:30am, with the course lecturer beginning at 8:30am. There will be two 15-minute refreshment breaks and a one-hour lunch break. The course is planned to end at 5:00pm. A final schedule will be send to registrants prior to the course date.

Contact Frank Magdich at Oak Environmental with any further inquiries or to register. frank@oakenviro.com Tel # 403 250-9810 Fax # 403 250-3978