Soil & Groundwater Pollution Courses

Characterisation, Remediation & Risk Management

National Centre for Groundwater Research and Training

Established in 1987, the Centre for Groundwater Studies (CGS) has now merged with the **National Centre for Groundwater Research and Training (NCGRT)**.

When	Where
9th Soil & Groundwater Pollution Course Monday 15 – Thursday 18 **November 2010**	Novotel Perth Langley, 221 Adelaide Tce, PERTH **WA**
10th Soil & Groundwater Pollution Course Tuesday 23 – Friday 26 **November 2010**	Novotel Melbourne on Collins, 270 Collins St, MELBOURNE **VIC**

Who Should Attend

The course is principally aimed at groundwater consultants, engineers, project managers, and regulatory/compliance officers in the public and private sectors. A basic understanding of the principles of groundwater flow is desirable. However, the course introduces all the required concepts pertaining to Soil and Groundwater Pollution from first principles.

Course Description

Industry and government are struggling with issues related to contaminated land and water resources. Initiatives such as the National Environmental Protection Measure (NEPM) have highlighted a risk-based approach for defining optimum remediation options for subsurface contamination. The prime objective of this course is to provide understanding of the important facets of subsurface pollution. The course will review the fundamentals of groundwater hydrology, contamination mechanisms of soil and groundwater and the implications of contamination. The state-of-the-art in contaminant hydrology will be explored through the use of case studies. Course content will thoroughly cover remediation with focus on the most important methodologies for the various contamination types and phases. The presenters will teach correct methods to collect hydrogeochemical data, and look at advanced characterisation in three-dimensions. Attendees will be led through the process of selecting and designing remediation systems based on geological, chemical, and biological factors, as well as an in-depth study of the integration of risk into the remediation process.

This specialist course offers excellent teaching on contaminant investigation and remediation, by an eminent international consortium of presenters and organisations including: University of Western Australia, Queens University Canada, Chevron Energy Technology.

Course Outline

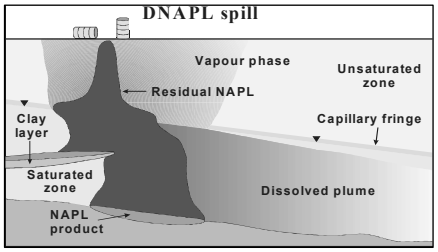
Fundamentals of Hydrogeology and Contamination
·Important concepts in contaminant hydrogeology
·Fate and transport of dissolved contamination
·DNAPLs in the subsurface
·LNAPLs in the subsurface
·Groundwater plumes in the subsurface
·Organic geochemistry
·Inorganic geochemistry
·Field methods to determine remediation design hydraulic parameters

Remediation of Soil and Vapour
·Methods to address inorganic contamination
·Vapour extraction systems, vacuum enhanced systems
·Practical design and operation of soil vapour extraction systems
·Thermal technologies
·In-situ & ex-situ treatment technologies
·Case histories

Remediation of Groundwater
·Bioremediation: Pathways, stoichiometry, reaction kinetics
·Engineering design for bioremediation
·Modelling for bioremediation
·Monitored natural attenuation
·Pump and treat systems
·Factors controlling the performance of pump and treat
·Assessing capture zones
·Case histories

Source Zone Remediation
·Zero valent iron barriers
·Nano-scale zero valent iron
·Use of surfactant flooding, water flooding, and alcohol flooding
·Thermal technologies for NAPL removal
·Oxidation and reduction approaches

Risk Assessment, Legislative Considerations, Case Studies and Practical Experience
·Advanced 3D site characterisation field methods
·Case Study: The importance of the Site Conceptual Model
·Case Study: The process of remedial investigation and remediation feasibility – flux based approaches for remediation



Expected Outcomes

·Become aware of up-to-date techniques for investigation of subsurface contamination and potential impacts
·Receive a firm guide on the basis and approach to assessment of risk from contamination of soil and groundwater
·Be exposed to national and international experience with a range of in-situ and ex-situ remediation techniques for organic and inorganic contamination
·Become aware of societal issues relating to contaminated sites and their remediation

Course Leader

Bernard H. Kueper, Ph.D is a professor in the Department of Civil Engineering at Queen's University, Kingston, Canada. His research focus is on the subsurface behaviour and clean-up of DNAPLs. Dr Kueper has published extensively and has lectured on the topics of DNAPL behaviour and remediation in professional short courses in Canada, USA, Switzerland, Denmark and Great Britain. His current work includes the evaluation of water flooding, surfactant flooding and alcohol flooding as methods of in-situ DNAPL removal, as well as the measurement of capillary pressure and relative permeability curves in fractured rock. Dr. Kueper has extensive experience investigating LNAPL and DNAPL sites throughout North America and other parts of the world on a consulting basis.

David A. Reynolds, Ph.D is a lecturer at the University of Western Australia, where he heads the Hydrogeology Research Group. His current research activities focus on the migration of DNAPLs in fractured rock at the microscopic and the mesoscopic scales, as well as the migration of NAPL and dissolved contaminants through fractured aquitards in porous media. He is the author of several multiphase flow and transport numerical models, and has applied his modelling expertise to a wide variety of sites throughout North America.

David G. Thomas, M.Sc. CPEng is a Contaminant Hydrogeologist with Chevron Energy Technology in Perth, Australia. He has over 17 years of practical experience in investigating and remediating complex contaminated sites. David is a recognised expert in his field within Chevron and the broader professional community. In 2007, he was appointed by the Minister for the Environment in Western Australia to the Contaminated Sites Committee, which functions as the legal appeal body for decisions made by the Department of Environment and Conservation regarding contaminated land. David has worked as a litigation technical expert and has delivered training courses at universities, vocational colleges, conferences and professional short courses in Australia, Asia, South Africa and North America.

Course Fees

AU$2490 (incl GST) includes: notes, tuition, morning and afternoon teas, and lunches.

Accommodation

Attendees are to **arrange own accommodation**.
*If you mention that you are part of this Course, you **may** be eligible for an accommodation discount at the course venue.*

9th Soil & Groundwater Pollution Course
Novotel Perth Langley, 221 Adelaide Tce, PERTH WA
Ph: +61 8 9221 1200 **Fax:** +61 8 9221 2830
Email: h1764@accor.com

10th Soil & Groundwater Pollution Course
Novotel Melbourne on Collins, 270 Collins St, MELBOURNE VIC
Ph: +61 3 9667 5800 **Freecall (AUS):** 1300 656 565 **Fax:** +61 3 9667 5805
Email: h1587@accor.com

AWA members receive a 5% discount

To register please see over leaf.

For more information contact: **Phone:** +61 8 8201 5632 **Fax:** +61 8 8201 5635
Email: industrytraining@groundwater.com.au **Web**: www.groundwater.com.au/industrytraining

REGISTRATION FORM / TAX INVOICE

ABN: 65 542 596 200

Please register early by faxing this form to **FAX: +61 8 8201 5635**

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TITLE: .....**FIRST NAME:** ..... **SURNAME:** .....

EMAIL: .....NB:Most communication will be via email

JOB TITLE: .....

COMPANY: .....

DEPARTMENT: .....

ADDRESS (Postal): .....

CITY: .....**COUNTRY/STATE:** ..... **POSTCODE:** .....

PH: ..... **MOB:** .....**FAX:** .....

WEB: .....

DIETARY REQUIREMENTS: .....

Fees – AU$

Course Title		Course Fee Includes GST
9th Soil & Groundwater Pollution, Mon 15-Thurs 18 November **WA**	***Early bird before Friday 1 Oct***	☐$ 2490.00
	After Friday 1 Oct	☐$ 2600.00
10th Soil & Groundwater Pollution, Tues 23– Fri 26 November **VIC**	***Early bird before Friday 8 Oct***	☐$ 2490.00
	After Friday 8 Oct	☐$ 2600.00
Less (choose 1 option only): ☐ 5% discount on *Course Fee only for IDA, IAH, AWA, NZHS, SIA, ACLCA Members (Member No.....) ☐10% discount on *Course Fee only for NCGRT, NCED Partner Staff (Partner name.....) ☐15% discount on *Course Fee only for Full-time Students (Institution name.....)		-$
TOTAL AU$		$

National Groundwater Working Group

PAYMENT – Please select payment method below:

ABN: 65 542 596 200

AWA members receive a 5% discount

1. ☐ Credit Card Please **debit** my: **☐ Visa** **☐ Mastercard**

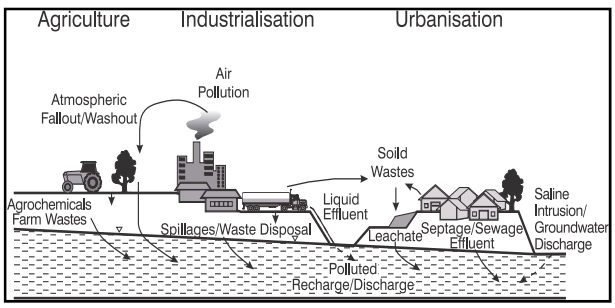
Card Number: __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __

Cardholder's Name: ..... Signature: .....

Expiry Date: __ __/__ __

2. ☐ Cheque Payable to: ***"NCGRT Groundwater Industry Training"***
Addressed to: NCGRT Groundwater Industry Training, Attn: Glenys Flight
GPO Box 2100,
ADELAIDE, SA 5001, Australia

3. ☐ Please send me a Tax Invoice **☐ Purchase order number:** .....



Terms, Conditions, Transfers and Cancellations for all *NCGRT Groundwater Industry Training*:

1 CONFIRMATION letter will be sent to all participants prior to a course. Participants must have received their confirmation letter before attending a course.

2 TRANSFER of your registration to a different course must be made in writing. This will incur an additional administration fee of $220.

3 CANCELLATIONS must be made in writing. Then the following terms will apply:
a. Less than 3 business days before a course: *No refund*
b. Between 3 business days and 3 weeks before a course: *50% refund*
c. More than 3 weeks before a course: Refund of the course fee minus an administration fee of $220
d. However, to avoid loss of the course and administration fees, a substitute attendee is welcome, by submitting a new Registration Form

4 If attendees CANCEL Field Trips, generally no refund will be paid.

5 While every attempt will be made to deliver courses as advertised, we reserve the right to cancel a course at short notice for conditions beyond our control. Notification of any such cancellation will attract a refund.

For more information contact: **Phone:** +61 8 8201 5632 **Fax:** +61 8 8201 5635
Email: industrytraining@groundwater.com.au **Web**: www.groundwater.com.au/industrytraining

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