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Dr Michael Rivett MA PhD FGS

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About

Dr Michael Rivett is a Senior Lecturer in Contaminant Hydrogeology in the **Water Sciences research group (/research/activity/water/index.aspx)** with a specialist field-scale research interest in the transport and remediation of organic contaminants in groundwater and contaminated land systems. He has published extensively on chlorinated solvents, DNAPLs and urban contamination and has additional on-going research interests in hyporheic zone – natural attenuation and radiological contaminants.

Qualifications

- PhD Earth Sciences - Hydrogeology, University of Birmingham (1989)
- MA Chemistry, University of Oxford (1984)

Biography

- 2007-present: Senior Lecturer in Earth Sciences – Contaminant Hydrogeology, University of Birmingham
- 1997-07: Lecturer in Earth Sciences – Contaminant Hydrogeology, University of Birmingham
- 996-97: Area Hydrogeologist, Environment Agency, Leeds
- 1994-96: Area Hydrogeologist, National Rivers Authority, Leeds
- 1989-93: Post Doctoral Research Associate, Waterloo Centre for Groundwater Research, University of Waterloo, Canada

Teaching

Postgraduate modules – MSc Hydrogeology

- Organic contaminant hydrogeology (MSc)
- Groundwater and contaminated land remediation (MSc)
- MSc research project supervision

Undergraduate modules – BSc/MSci Geology Programmes

- Human impact on the geological environment ESCM 328/448 (Years 3, 4)
- Hydrogeology ESCM 221 (Year 2)
- Global environmental issues GGM 103 (Year 1)
- Project / dissertation supervision (Years 3, 4)

Postgraduate supervision

Potential students interested to work in Dr Rivett's research group should email him briefly outlining their main area of research of interest and a CV. His current PhD research students are below:

- **Armstrong-Pope, N., PhD in progress (part-time).** Determination of risks posed by potential radiological-contaminated groundwater discharges to coastal shoreline and river receptors. Funded by Sellafield Ltd.
- **McMillan, L., PhD in progress.** Groundwater quality: Rigorous sampling and interpretation of long-screen wells. NERC case studentship supported by Waterra and the Environment Agency.
- **Batty, T. PhD in progress.** Metal sorption to Triassic sandstone: the utility of the Kd concept. NERC case studentship supported by ESI.

Research

A selection of current and recent research projects are provided below:

Hyporheic zone (Groundwater - surface-water interactions)

- Assessment of winter motorway runoff to a surface water infiltrating to groundwater. Funded by the Environment Agency

- Determination of risks posed by potential radiological-contaminated groundwater discharges to coastal shoreline and river receptors. Funded by Sellafield Ltd.
- Use of the urban hyporheic zone for contaminant attenuation – the SWITCH study site. EC Framework 6 SWITCH (Sustainable Water Is Tomorrows' Cities' Health) Project also funded by the Environment Agency.
- Modelling the development of gas concentration profiles in the hyporheic zone and their importance for hyporheic exchange flows.
- Mass flux and natural attenuation of chlorinated solvent plumes in the hyporeheic zone (various funders and field sites)

DNAPLs, chlorinated solvents and VOCs

- Development of urban groundwater supplies at risk from chlorinated solvent contamination. Supported by MWH Global with Severn Trent Water.
- Review of unsaturated-zone transport and attenuation of volatile organic compound (VOC) plumes leached from shallow source zones. In collaboration with BGS funded by AkzoNobel
- Use of longitudinal Streamtube monitoring approaches to determine TCE contaminant fate within the SABRE intra-source/plume test cell. In collaboration with BGS funded by CL:AIRE and the Environment Agency.

Groundwater monitoring and contaminant transport

- Groundwater quality: Rigorous sampling and interpretation of long-screen wells. NERC case studentship supported by Waterra and the Environment Agency.
- Organic contaminant transport through a thin clay aquitard influenced by palaeo-heterogeneities. Funded by: Environment Agency, Celtic Technologies Ltd, Waste Management Research Ltd, Cleansing Service Group Ltd.
- Metal sorption to Triassic sandstone: the utility of the Kd concept. NERC case studentship supported by ESI.
- Review of nitrate attenuation. In collaboration with ESI on behalf of the Environment Agency.

Other activities

Dr Rivett's professional memberships and other professional activities include the following:

Journal of Contaminant Hydrology – Editorial Board member (2006-08; 2009-12)

Quarterly Journal of Engineering Geology & Hydrogeology – Editorial Board member (2000 – 03; 2008-11)

Chair (incoming) of the British Chapter of the International Association of Hydrogeologists (IAH) (2012 - …)

The Geological Society of London

- Council of the Geological Society – Member (2006 - 09)
- Geological Society Professional Committee – Member (2006 – 08)
- Science Council – Advisory Group on Sustainability – Member representing the Geological Society (2005 – 06)
- Hydrogeological Group - Chairman (2004 – 06)
- Geological Society Science Committee – Member (2004-06)
- Hydrogeological Group Committee - Member (2001 – 06)
- Society Fellow (1998 - …)

CL:AIRE Technology and Research Group (TRG) Advisory Group Member (2008 - …)

Member of the International Association of Hydrogeologists (IAH) (1992 - ..)

Member of the International Association of Hydrogeological Sciences (IAHS) (1999 - ..)

Sellafield Ltd. Land Quality Independent Peer Review Panel member (2008 – to date)

SABRE (Source Area Bioremediation) Dti – BioLink research project – Scientific advisor (2005-09)

EPSRC Peer Review College Member (2003-05) (2006-09) (2012 -…)

PhD examiner (25 occasions, 10 universities)

Consultancy / research project work for various environmental – hydrogeological consultancy companies, industry and regulatory agency organizations

Conference or conference session convening – numerous UK and several international meetings

Short courses – Leader and contributor to University of Birmingham and other short courses on contaminated land and groundwater contamination and remediation

Publications

See a full list of Dr Rivett's publications (PDF 683KB) (/Documents/college-les/gees/staff/rivett-publications.pdf)

A selection of journal publications since 2007

Rivett, M.O., Ellis, P.A., Mackay, R., 2011. Urban groundwater baseflow influence upon inorganic river-water quality: the River Tame headwaters catchment in the City of Birmingham, UK. *Journal of Hydrology*, 400, 206-222. doi:10.1016/j.jhydrol.2011.01.036

Rivett, M.O., Wealthall, G.P., Dearden, R.A., McAlary, T.A., 2011. Review of unsaturated-zone transport and attenuation of volatile organic compound (VOC) plumes leached from shallow source zones. *Journal of Contaminant Hydrology*, 123, 130–156. doi:10.1016/j.jconhyd.2010.12.013

Cuthbert, M.O., Mackay, R., Durand, V., Aller, M.-F., Greswell, R.B., **Rivett, M.O.**, 2010. Impacts of river bed gas on the hydraulic and thermal dynamics of the hyporheic zone. *Advances in Water Resources*, 33, 1347–1358. doi:10.1016/j.advwatres.2010.09.014

White, R.A., **Rivett, M.O.**, Tellam, J.H., 2008. Paleo-roothole facilitated transport of aromatic hydrocarbons through a Holocene clay bed. *Environmental Science & Technology*, 42, 7118-7124. Doi: **10.1021/es800797u (http://dx.doi.org/10.1021%2Fes800797u)**

Rivett, M.O., Thornton, S.F., 2008. Monitored natural attenuation of organic contaminants in groundwater: principles and application. *Water Management,* 161(6), 381-392.

doi: 10.1680/wama.2008.161.6381

Rivett, M.O., Buss, S.R., Morgan, P., Smith, J.W.N., Bemment, C.D., 2008. Nitrate attenuation in groundwater: a review of biogeochemical controlling processes. *Water Research*, 42, 4215-4232. doi: 10.1016/j.watres.2008.07.020

Rivett, M.O., Ellis, P.A., Greswell, R.B., Ward, R.S., Roche, R.S., Cleverly, M., Walker, C., Conran, D., Fitzgerald, P.J., Willcox, T., Dowle, J., 2008. Cost-effective mini drive-point piezometers and multilevel samplers for monitoring the hyporheic zone. *Quarterly Journal of Engineering Geology & Hydrogeology* , 41(1) 49-60. doi: 10.1144/1470-9236/07-012

Rivett, M.O., Smith, J.W.N., Buss, S.R., Morgan, P., 2007. Nitrate occurrence and attenuation in the major aquifers of England and Wales. *Quarterly Journal of Engineering Geology & Hydrogeology* 40(4), 335-352. doi: 10.1144/1470-9236/07-032

Rivett, M.O., Clark, L., 2007.A quest to locate sites described in the world's first publication on trichloroethene contamination of groundwater. *Quarterly Journal of Engineering Geology & Hydrogeology*, 40(3), 241-249. doi: 10.1144/1470-9236/06-047

Ellis, P.A., Mackay, R., **Rivett, M.O.**, 2007. Quantifying urban river–aquifer fluid exchange processes: A multi-scale problem. *Journal of Contaminant Hydrology*, 91, 51-80. doi: 10.1016/j.jconhyd.2006.08.014

Ellis, P.A., **Rivett, M.O.**, 2007. Assessing the impact of VOC-contaminated groundwater on surface-water at the city scale. *Journal of Contaminant Hydrology*, 91, 107-127. doi: 10.1016/j.jconhyd.2006.08.015

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