



WHAT

Use of the deep subsurface in the UK: what are the implications for groundwater resources?

WHERE

The Geological Society, Burlington House, London, UK

WHEN

11–12 July 2018

There is renewed interest in the deep (>200 m below ground level) onshore sub-surface in the UK, with increasing exploration for, and development of:

- conventional and unconventional oil and gas
- geothermal energy
- potash mining

and for storage purposes including:

- nuclear waste
- natural gas
- carbon dioxide.

However, the use of the deep subsurface introduces significant technological challenges and with this an element of risk to groundwater resources, both in terms of quality and quantity. To effectively assess and manage the risks, a far better understanding of natural hydrogeological conditions (physical, chemical and biological) at depth and the hazards and potential impacts associated with the different activities is required. This presents unique challenges due to difficulties accessing, measuring and/or retrieving information from the deep subsurface.

This meeting will bring together a range of stakeholders including those responsible for policy and decision making,

researchers and technologists. The current state of knowledge will be discussed and the critical gaps that need to be addressed to better understand, assess and manage the risks to groundwater from deep sub-surface activities along with the associated uncertainties will be identified.

We welcome contributions related to:

- **Characterisation**—of deep groundwater systems and pathways to shallower groundwater, aquifers and groundwater-dependent surface environments,
- **Flow and transport**—understanding of flow and transport processes in deep groundwater systems and along migration pathways,
- **Environmental risks and impacts**—including cumulative impacts on groundwater quality and quantity, from the development of deep sub-surface resources or storage,
- **Policy challenges**—legislation, regulation and planning in relation to deep groundwater systems and activities, and
- **Communication and engagement**—how can we better communicate risks and foster improved engagement with communities affected by use of the deep subsurface.



©Dex Images PTE Ltd

Studies may include field measurements, geophysics, modelling, and laboratory experiments among others.

It is anticipated that contributions will have a UK focus but talks demonstrating international experience that is directly relevant to the UK context are also encouraged. The programme will be framed to promote the dissemination of research and sharing of knowledge between research communities and with a relevance to those involved with planning, policy and decision making.

Keynote speakers

Kevin Parks (Alberta Energy Regulator)
Irina Gaus (Nagra)
Avner Vengosh (Duke University)

New abstract deadline!

We are accepting abstracts of up to 300 words for both poster and oral presentations. Please follow instructions and the template available on our website. Deadline Friday 6th April.

Convenors

Tim Besien (Environment Agency)
John Bloomfield (BGS)
Ian Davey (Environment Agency)
Barnaby Harding (ESI)
Stefan Krause (University of Birmingham)
Sian Loveless (BGS)
Ulrich Ofterdinger (Queen's University, Belfast)
Mike Rivett (GroundH2O plus)
Sarah Scott (Environment Agency)
Rob Ward (BGS)
Fred Worrall (Durham University)

Sponsorship

We would welcome sponsorship for this conference. Sponsors will receive promotion at the event. Details of the packages can be provided on request. If you would like to find out more please contact Barnaby Harding (BarnabyHarding@esi-consulting.co.uk).

For more information please contact:

Sian Loveless or Carole Sharratt

British Geological Survey, Keyworth, Nottingham NG12 5GG

email: sian@bgs.ac.uk or cesh@bgs.ac.uk #UDSIG

<https://www.hydrogroup.org.uk/use-of-the-deep-subsurface-in-the-uk-what-are-the-implications-for-groundwater-resources/>



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Use of the Deep Subsurface in the UK: What are the Implications for Groundwater Resources

11/12 July 2018

Programme

Wednesday 11 July

09:00	Registration and tea and coffee
Session 1: Methodology	
09:45	Welcome
09:50	Avner Vengosh (Invited Speaker, Duke University)
10:20	Capabilities and limitations of microseismic monitoring of fluid injection Stork, A (University of Bristol)
10:40	Using microseismic monitoring to track hydraulic fracture growth and interactions with faults Verdon, J (University of Bristol)
11:00	Sensing technology for in-situ detection of dissolved methane and volatile organic compounds in groundwater Boughrara Salman, A (TWI Ltd)
11:20	Posters and tea and coffee break
Session 2: Characterisation (rock)	
11:50	Characterization of a deep sandstone aquifer at a range of scales West, L J (University of Leeds)
12:10	Assessment of hydraulic properties of analogous Scottish and Lithuanian Devonian sandstones using X-Ray computed tomography imaging Watson, S M (University of Glasgow)
12:30	Plumbing the depths — the role of hypogenic karst in deep groundwater flow Farrant, A (British Geological Survey)
12:50	Poster summaries
13:10	Posters and Lunch
Session 3: Flow and transport	
14:00	Kevin Parks (Invited Speaker, Alberta Energy Regulator)
14:30	Groundwater flow in fractured crystalline rocks — a fresh paradigm Black, J H (In Site Hydro Ltd)
14:50	Hydrogeological investigation using deep borehole packer tests; considerations for test methods and analysis Austin, E (Golder Associates)
15:10	Characterising the deep subsurface: what can we understand from single well tests? Digges La Touch, G (Golder Associates)
15:30	Posters and tea and coffee break
Session 4: Characterisation (fluids)	
16:00	Monitoring the water-chemistry baseline in the context of shale gas: the Vale of Pickering, North Yorkshire Smedley, P L (British Geological Survey)
16:20	Thermal waters of the UK: geochemical indications of flow and vulnerability Darling, W G (British Geological Survey)
16:40	Q&A and discussion
17:00	Posters and reception

Thursday 12 July

08:15	Registration and tea and coffee
Session 1: Environmental risks and impacts	
08:55	Welcome
09:00	Irina Gaus (Invited Speaker, Nagra)
09:30	Should all groundwater be protected? Lewis, M (British Geological Survey)
09:50	Lessons learned from development of the Williston Basin Ferguson, G (University of Saskatchewan)
10:10	How much polyacrylamide can be lost by adsorption during slick-water fracking operations? Ward, C (Durham University)
10:40	Posters and tea and coffee break
Session 2: Environmental risks and impacts	
11:10	Can we adequately identify groundwater compartmentalisation in the Bowland Basin for hydraulic fracturing risk assessments? Wilson, M P (Durham University)
11:30	A methodology to assess 3D groundwater risk from hydraulic fracturing and other hydrocarbon activities Loveless, S (British Geological Survey)
11:50	A dynamic risk assessment model for the contamination of water resources from hydraulic fracturing in the UK Milton-Thompson, O (University of Exeter)
12:10	Numerical assessment of the cumulative impact of multiple hydraulic fracturing operations on groundwater quality in UK shallow aquifers Bianchi, M (British Geological Survey)
12:30	Posters and Lunch
Session 3 : Policy	
13:20	Environment Agency (Invited Speaker, TBC)
13:50	The SHEER Project: outcomes for groundwater and best practice in relation to unconventional gas Gunning, A (RSKW)
14:10	Source protection zones for deep drilling through confined aquifers: an example from the Spilsby Sandstone Fretwell, B A (Wood Environment& Infrastructure Solutions)
14:30	Ensuring environmental protection for geological disposal Brazier, D (Environment Agency)
14:50	Panel 2 : UK Policy Challenges
15:20	Posters and tea and coffee break
Session 4: Communication and engagement	
15:50	Wressle— deep oil and gas resource — shallow pollution linkages — public inquiry lessons Jones, A (JBA)
16:10	Long-term community engagement to ensure delivery of research associated with contentious issues Ward, R S (British Geological Survey)
16:30	Close

Posters

Model-based assessment of subsurface flows and geochemistry for conceptualising subsurface processes at a future geothermal (research) site

Abesser, C (British Geological Survey)

In hot water—geothermal energy in Scotland

Butler, P (SEPA)

Visualising deep aquifers in monitoring related to shale gas developments—a case study from Fylde, Lancashire

Butcher, A (British Geological Survey)

Hydrogeology of the Fylde; an area of potential shale gas development

Bell, R A (British Geological Survey)

Geothermal use of the subsurface in the Anglo-Paris Basin: what are the lessons for groundwater resources and thermal processes?

Dentzer, J (Ecole Normale Superieure)

Permo-Triassic Sandstone as a heat source, concept for a geothermal heating scheme in Offenham

Eckhardt, T (WSP)

Use of brine production to increase CO₂ storage capacity and security

Mackay, E J (Heriot-Watt University)

Produced water and inorganic scale management during shale gas production

Mackay, E J (Heriot-Watt University)

Wastewater from hydraulic fracturing: understanding the risk

O'Donnel, M C (University of Edinburgh)

Modelling of permafrost and groundwater development in contrasting illustrative geological environments over glacial time-scales

Scheidegger, J (British Geological Survey)

Monitoring CO₂ containment with microseismicity

Stork, A L (University of Bristol)

Using polyacrylamide as an additive in a simple slick-water fracking fluid, can we influence the flow-back water composition?

Ward, C (Durham University)
