# PhD Studentship in Aspects of the Geological Disposal of High Level Nuclear Waste

## PhD Outline

A PhD studentship is available to study the thermo, hydraulic, mechanical and chemical (THMC) behaviour of clay-based engineered barriers with a start date of October 2012. The research topic is described more fully below:

***The effects of elevated temperatures on the behaviour of compacted clay barrier in nuclear waste disposal.***

A significant challenge in Engineered Barrier System (EBS) design is predicting the long-term behaviour of compacted bentonite clay barriers. Swelling clays exhibit highly coupled thermal, hydraulic, mechanical and chemical behaviour. This research is designed to develop an understanding of coupled THMC processes under temperatures up to $150^0$C. The work will, in the main, involve experimental investigations. In particular, an experimental study of heating and hydration of compacted bentonite will be conducted.

## Project Finance

The PhD will be fully funded as follows:

- A stipend of £13590 per year, tax free, with inflationary increases.
- The University fee, which will be funded at the current UK/EU student rate.

## Student Profile

The student should:

- Be interested in experimental work.
- Have a high classification degree in civil engineering, geology or other relevant subject.
- Be enthusiastic motivated and willing to learn.

## Duration

Funding is available for a 3.5 year studentship

## Location

The studentship is available at the Geoenvironmental Research Centre (GRC), Cardiff School of Engineering
http://grc.engineering.cf.ac.uk/
The research work will be carried out under the guidance of Dr S Tripathy, Professor H R Thomas and Dr M Sedighi.

## SAFE Barriers

The studentship forms part of a new project called SAFE Barriers (a Systems Approach For Engineered Barriers). This is a multidisciplinary project, funded by EPSRC and the Nuclear Decommissioning Authority (NDA), looking into the THMC evolution of Engineered Barrier Systems (EBS) under a range of environmental conditions. The programme takes a whole systems approach to the EBS, underpinned by the development of novel advanced monitoring techniques.

The project integrates a strong team of multi-disciplinary researchers in civil engineering, earth sciences, mathematical modelling, geophysics and wireless monitoring. Highly experienced researchers will work closely with early-stage researchers to foster a new generation of experts in geological disposal research in the UK. SAFE Barriers is a joint project between the Universities of Strathclyde, Cardiff, Edinburgh, Glasgow, Newcastle, Nottingham and Oxford and the British Geological Survey.

## Contacts

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