

HYDROFACIES IN SANDSTONES. EVIDENCE FOR FEEDBACK BETWEEN SANDSTONE LITHOFACIES AND PERMEABILITY DEVELOPMENT

J.P. Bloomfield (1), A. Newell (1), M Moreau (1)

(1) British Geological Survey, Wallingford, UK. jpb@bgs.ac.uk/Fax: +44 1491 692345

In order to enhance our ability to develop effective numerical models of flow and contaminant transport in the Permo-Triassic sandstone aquifer of the UK, relationships between lithofacies, rock mass characteristics (such as porosity and pore-throat size distribution), and permeability have been investigated through a series of case studies. Flow in the Permo-Triassic sandstones is primarily through the matrix. Permeability distribution is principally a function of the pore-throat size distribution and there is a relatively weak correlation with primary sedimentary lithofacies. It is observed that matrix permeability data broadly fall into two, discontinuous, sub-populations above and below about 1 mD. It is proposed that modification of primary sedimentary lithofacies by circulation of groundwater is the main control on the development of these two permeability sub-populations or hydrofacies. Identification of these two hydrofacies has significant implications for numerical modelling of the sandstones.