

Bouch, Jon E.; Hough, Ed; Kemp, Simon J. ; McKervey, John A.; Williams, G.M.; Gresswell, Richard B.. 2006 Sedimentary and diagenetic environments of the Wildmoor Sandstone Formation (UK) : implications for groundwater and contaminant transport, and sand production. In: Barker, R.D.; Tellam, J.H., (eds.) *Fluid flow and solute movements in sandstones : the onshore UK Permo-Triassic red bed sequence*. London, UK, Geological Society of London, 129-153. (Geological Society Special Publications, 263, 263).

The Wildmoor Sandstone Formation, proved in three boreholes drilled at Birmingham University, is dominated by fine- to medium-grained sandstones deposited in a braided river environment, within which channel lag, channel fill and abandoned channel facies are recognized. Minor proportions of aeolian sandsheet are present, as are dolocretes, not previously reported in the formation.

The sandstones are feldspathic and lithic arenites, and typically are clay-poor. Early dolomite dominates the diagenetic overprint, and is preferentially developed in channellag deposits. Burial diagenetic effects are minor. Late calcite occurs as a pore-filling phase and within fractures.

Minor fractures and granulation seams are oriented parallel to the NE-SW Birmingham Fault. 'Conventional' granulation seams, with comminution of detrital material, and more complex seams containing comminuted dolomite cement with a millimetre-wide halo of dolomite cement are present, the latter implying that the sandstone was dolomitecemented at the time of fracturing.

Several scales of heterogeneity will affect groundwater solute transport. The palaeosols and abandoned channel mudstones may act as barriers to vertical flow at the decimetre scale. Dolomite-cemented channel-lag deposits may act similarly at smaller scales. Granulation seams have permeabilities of two-three orders of magnitude lower than their host sandstones, but their limited occurrence may limit their impact on larger scale flow. Matrix permeability is controlled by grain size and dolomite cement.

The fines in the fine-grained, ripple cross-laminated sandstones were extensively washed out during coring, and this lithology may be a source of sand yields in some sandstone boreholes. Although no enhancement of particle yields was seen during packer testing, the possibility remains that more comprehensive failure may occur at higher pumping rates.