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CONTENTS – Volume 44, Part 2, May 2011

Research Articles

Groundwater and the law

A.N. Charalambous 147

A review of hydrogeology and water resources on the Isle of Wight

L. Maurice, M. Packman & P. Shaw 159

Stable isotope evidence for the hydrogeological characteristics of clay-rich till in northern East Anglia

K.M. Hiscock, M.A. George & P.F. Dennis 173

The application of analytical solutions to the thermal plume from a well doublet ground source heating or cooling scheme

D. Banks 191

A neural network approach to predict the performance of recycled concrete used in permeable reactive barriers for the treatment of acidic groundwater

B. Guruprasad, B. Indraratna, L.D. Nghiem & G. Regmi 199

Refraction microtremor (ReMi) to determine the shear-wave velocity structure of the near surface and its application to aid detection of a backfilled mineshaft

M.G. Raines, D.A. Gunn, D.J.R. Morgan, G. Williams, J.D.O. Williams & S. Caunt 211

Sinking a jacked caisson within the London Basin geological sequence for the Thames Water Ring Main extension

T.G. Newman & H.-Y. Wong 221

Reactivation of landsliding following partial cliff stabilization at Barton-on-Sea, Hampshire, UK

M.E. Barton & P.M. Garvey 233

Landslide mechanism analysis in the Three Gorges based on cloud model and formal concept analysis

X. Wang, R. Niu & Y. Wang 249

The identification, appraisal and assessment of hazards on quarry rock faces in terms of the UK Quarries Regulations

G.D. Matheson & G.M. Reeves 259

Technical Note

Particle size distribution of dune sand from Libya

J.H. Charman & G. West 277

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Cover Photograph. The surface rupture of the previously unmapped Greendale Fault extended west–east for 28 km across gravel-dominated alluvial plains west of Christchurch, New Zealand, during the shallow-focus (*c.* 10 km depth), M_w 7.1 Darfield Earthquake which struck at 4.35 am on 4 September 2010 (New Zealand Standard Time). Along the central 14 km of surface rupture, 2 to 5 m of right-lateral displacement is distributed across a 30 to 150 m wide deformation zone, via Riedel shears, conjugate Riedel shears, horizontal flexure and decimetre-amplitude anticlinal bulging. In this aerial view looking NW, the deformation zone is up to 40 m wide, and the right-lateral displacement is 3 to 4 m. The photograph was taken 12 hours after the earthquake by Richard Jongens (GNS Science, member of the University of Canterbury & GNS Science Fault Rupture Response Team).