The ‘Implementing Geological Disposal – Technology Platform’ (IGD-TP) is composed of European waste-management organizations and has a vision that “by 2025 the first geological disposal facilities for spent fuel, high-level waste and other long-lived radioactive waste will be operating safely in Europe”.

The first IGD-TP Geodisposal Conference was held at The University of Manchester, UK from June 24th – 26th 2014 and provided a new forum for researchers in this area to present their work. The Conference brought together >270 delegates from across 23 countries and an important aspect of the conference was to showcase and publish research relevant to geological disposal of radioactive waste. The conference was also an opportunity for more advanced geological programmes to share >30 years of Research and Development and Demonstration (RD & D) and implementation experience in geological disposal with less advanced programmes.

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The Conference organising committee comprised: Raymond Kowe, Radioactive Waste Management Ltd., UK; Nic Bilham, Geological Society, UK; Nick Bryan, National Nuclear Laboratory, UK; Gunnar Buckau, Joint Research Centre, Germany; Jacques Delay, ANDRA, France; Daniela Diaconu, Institute for Nuclear Research, Romania; Nick Evans, Loughborough University, UK; Hans Forström, SKB, Sweden; Erik Kremer, NWMO, Canada; Katherine Morris, The University of Manchester, UK; Kevin Murphy, The Mineralogical Society, UK; Cherry Tweed, Radioactive Waste Management Limited, UK; Ewoud Verhoef, COVRA, The Netherlands; Juhani Vira, POSIVA, Finland; and Claudia Vivalda, Nidia srl, Italy. The scientific committee consisted of: Katherine Morris, The University of Manchester, UK; Nick Bryan, National Nuclear Laboratory, UK; Nick Evans, Loughborough University, UK; Horst Geckeis, Karlsruhe Institute of Technology, Germany; José Luis Fuentes-Cantillana, AITEMIN, Spain; Mats Jonsson, KTH Royal Institute of Technology, Sweden; Wolfgang Kickmaier, MCM International, Switzerland; Rebecca Lunn, University of Strathclyde, UK; André Maes, KU Leuven, Belgium; Caroline Peacock, University of Leeds, UK; Karsten Pedersen, Chalmers University of Technology, Sweden; Richard Shaw, British Geological Survey, UK; and Behnam Taebi, TU
Delft, Netherlands. Both the organizing committee and the scientific committee would like to thank the sponsors of the Conference. Papers derived from the conference talks and posters are presented in this special issue of *Mineralogical Magazine*. All of the papers underwent independent peer review and the *Mineralogical Magazine* IGD–TP Geodisposal 2014 special issue Guest Editors Katherine Morris, The University of Manchester; Nick Bryan, National Nuclear Laboratory and Nick Evans, Loughborough University would like to express their thanks to all the reviewers that provided detailed comments and feedback on all the papers which were submitted to the special issue.

The conference sessions were organized into thematic sessions which were based around the IGD–TP’s Strategic Research Agenda and other research related to geological disposal across Europe. The key topics covered were: radionuclide and gas behaviour; natural systems including biogeochemistry, biosphere and geosphere; monitoring; engineered barriers, wasteforms and criticality; societal aspects; national programmes for geological disposal; safety case; and, disposal concept and technology development. There was also a discussion session on future IGD-TP activities and Horizon 2020-funded projects involving newer member states.

**Section 1: Radionuclide and Gas Behaviour**

The first section includes papers on: gas-transport results from the EU FORGE project (Bond et al., 2015); behaviour of uranium with the iron oxide magnetite (Marshall et al., 2015); carbon-14 behaviour in alkaline iron-water systems (Wieland et al., 2015); the fate of the radionuclide neptunium-237 in alkaline sediment microcosms (Williamson et al., 2015); retention of chlorine-36 in alkaline cement systems (van Es et al., 2015); bentonite colloid behaviour in ternary systems (Sherriff et al., 2015); gas migration in a high-level waste disposal tunnel (Justinavicius and Poskas, 2015); carbon-14 behaviour in reactor graphite cores (Payne et al., 2015); and a paper on visualization of flow paths in clay minerals (Wiseall et al., 2015).

**Section 2: Natural Systems Including Biogeochemistry, Biosphere and Geosphere**

The discussion of natural systems includes a diverse range of papers covering: iodine behaviour in model sediment systems (Guido-Garcia et al., 2015); characterization of the mineralogy and redox reactivity of potential GDF host rocks in the UK (Quirke et al., 2015); modelling studies applying pore network models to Opalinus clay (Xiong and Jivkov et al., 2015); the behaviour of pertechnetate in hyperalkaline conditions in the context of recrystallization of kaolinite (Littlewood et al., 2015); the impact of GDF-relevant temperatures on clay systems in the context of high-level waste disposal (Jobmann and Meleshyn, 2015); the impact of humic substances on metal ion behaviour (Bryan et al., 2015); an evaluation of the Herberts Quarry site in the UK as an analogue for intermediate level waste disposal (Moyce et al., 2015); a study examining the inhibition of colloidal formation in intermediate level waste systems (Felipe-Sotelo et al., 2015); microbial degradation of cellulosic materials under conditions relevant to intermediate level waste disposal (Bassil et al., 2015); microbial degradation of isosaccharinic acid under far-field conditions (Kuippers et al., 2015); radiation damage studies in natural sheet silicate minerals (Bower et al., 2015); and a representation of biosphere systems in the UK relevant to higher activity waste disposal (Walke et al., 2015).

**Section 3: Monitoring**

Here, a paper on applying a micro-electro-mechanical system to monitor conditions in a bentonite buffer system is discussed (Yang et al., 2015).

**Section 4: Engineered barriers, wasteforms and criticality**

Here, papers cover: bentonite buffer erosion in fracture systems (Reid et al., 2015); carbon-14 behaviour in the engineered geological disposal facility system (Doulgeris et al., 2015); modelling post-closure criticality events associated with spent-fuel disposal (Mason et al., 2015); the European Network of Testing Facilities for the ‘Quality Checking of Radioactive Waste Packages’ (ENTRAP) programme and its potential interaction with the IGD-TP (Tietze-Jaensch et al., 2015); manufacturing of copper canisters for geological disposal (Hernandez-Selva et al., 2015); dissolution of MAGNOX blend nuclear waste glass (Cassingham et al., 2015); the impact of thermal cycling on bentonite permeability (Zihms and Harrington, 2015); and on the likelihood and consequences of post-closure criticality in a geological disposal facility (Winsley et al., 2015).
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Section 5: Societal Aspects
This session includes contributions on: integrating societal concerns into R&D for geological disposal at a national level (Martell and van Berendoncks, 2015); and a paper on the investigation of attitudes, needs and expectations of a local community where waste disposal is relevant (Constantin et al., 2015).

Section 6: National programmes for geological disposal
In this section, the conference papers cover: the Lithuanian programme for spent fuel (Poskas et al., 2015); the Implementing Geological Disposal Technology Platform in the context of addressing the needs of new member states (Kowe et al., 2015); and an overview of the less advanced programmes and their requirements (Diaconu et al., 2015).

Section 7: Safety Case
Here papers are presented on: the safety case for the biosphere in the context of the mature, Finnish safety case (Ikonen, 2015); the influence of anthropogenic CO₂ on post-closure performance assessment (Lord et al., 2015); the design of waste packaging for heat generating wastes (Myers et al., 2015); development of a generic safety case narrative for the UK geological disposal facility (Bailey, 2015); and an integrated approach to disposal of the UK’s carbon-14 wastes (Lever and Vines, 2015).

Section 8: Disposal concept and technology development
In this final section, the papers cover: technology transfer from the space and physics sectors (Direito et al., 2015); and, the state-of-the-art with respect to repository concepts for crystalline rocks (Kronberg et al., 2015).

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References


