

# Mining Technology technical community within the Institute of Materials, Minerals and Mining

## Conference 2021

### *Legacies of mineral extraction and sustainability opportunities*

#### Conference Brochure

9 November 2021	Pre-conference Field Trip
10 November 2021	Day 1 Registration Opening Address Keynote Presentation Session 1 – New life for old mine sites (1) Session 2 – New life for old mine sites (2) Session 3 – An international commentary Conference buffet and entertainment
11 November 2021	Day 2 Registration J F Tunnicliffe Medal presentation Session 4 – Mine water management Session 5 – New life for old mine sites (3) Session 6 – Impact of mining legacy on surface development Closing remarks

Britain has a long history of mining and mineral extraction. Its legacies are the environmental, social and engineering consequences of completed mining operations, ranging from subsidence and ground movement and unmapped voids to contamination, gas emissions and water flows. In 2000, the North of England Institute of Mining and Mechanical Engineers held a conference to highlight and identify some of these legacies and to discuss methods of restoration and regeneration. The purpose of Conference 2021 is to review events that have changed thinking, improved methods and equipment in the 20-year passage of time. Considering the lessons learned in this period will be used as an important addition to discuss creation of sustainable opportunities looking at mining from cradle to grave.

## Speaker/Lead Speaker

### Day 1

10:00 – 10:10	Welcome	Christine Blackmore, Chair, Mining Technology Board
10:10 – 10:30	Opening Address	Darryn Quayle, Department of International Trade
10:30 – 11:00	Keynote Presentation	Andrew Clark, North East Local Enterprise Partnership
11:30 – 13:00	Session 1: New life for old mine sites (1) <i>Making the most of abandoned mines: Ecton Mine Educational Trust</i> <i>The use of void space created by mining activity for beneficial purposes</i> <i>Circular Economy: Bates Clean Energy Terminal</i>	Stephen Henley, Resources Computing International Ltd Steve Reece, Chartered Engineer Tom Chaplin, Port of Blyth & Colin Lambert, The Coal Authority
14:00 – 15:30	Session 2: New life for old mine sites (2) <i>Energy storage for mining legacies: Facilitating the green revolution</i> <i>Carbon Capture, Use and Storage: UK potential</i> <i>Integrating mine planning leading to sustainable post-mining transition</i>	Chris Yendell, Gravitricity Jon Gluyas, Durham Energy Institute Robrecht Schmitz, Sibelco
16:00 – 17:30	Session 3: An international commentary <i>Managing legal risks in mining projects: Lessons learned from the International Arbitration of Disputed Mining Projects</i> <i>Legacies of mining in community perception: Recognition and reconstruction in mine reopening</i> <i>Developing and sustaining competence in safety critical roles</i> <i>Sustainable nickel for a low carbon future</i>	Lorraine de Germiny, LALIVE (London) LLP Alex Cisneros, Wardell Armstrong International Kevin Sabin, TSA Ltd Anne Oxley, Brazilian Nickel
19:00	Buffet Supper & Entertainment (Ashington Colliery Brass Band)	Compère: Norman Jackson

### Day 2

09:00 – 09:10	Welcome	David Seath, Mining Technology Board
09:10 – 09:30	J F Tunnicliffe Medal Presentation	John Tunnicliffe, Past President, Institution of Mining Engineers
09:30 – 11:00	Session 4: Mine water management <i>Mine Water: A potentially important heat source</i> <i>Research and innovation opportunities for mine water and heat storage at the UK Geoenery Observatory in Glasgow</i> <i>Coal mine water management: Improving approaches through evidence and experience</i>	Charlotte Adams, The Coal Authority Alison Monaghan, British Geological Survey Alice Mellor, The Coal Authority
11:30 – 13:00	Session 5: New life for old mine sites (3) <i>Glenmuckloch Energy Project</i> <i>The changing societal and environmental expectations: Implications and impacts for the mining industry</i> <i>Breathing new life into abandoned mines: The Robominers Project</i>	Alan Wilson, Buccleuch Estates Paul Bradley, Health and Safety Executive Stephen Henley, Resources Computing International Ltd
13:45 – 15:15	Session 6: Impact of mining legacy on surface development <i>The Coal Authority's role in facilitating redevelopment of sites impacted by coal mining and the promotion of a safe, assured and sustainable future</i> <i>Identifying challenging ground hazards for remediation and land development: A Case Study of a site affected by over 300 closely spaced bell pits, NW Leicestershire</i> <i>The challenges of managing access to The Coal Authority underground mine and mineral property portfolio</i>	Leigh Sharpe & Chris Telford, The Coal Authority Russell Hurcombe, GRM Development Solutions Stuart Walker, The Coal Authority
15:15 – 15:30	Closing Remarks	Christine Blackmore, Chair, Mining Technology Board



## Presenters Pen Pictures



**Christine Blackmore, Chair MTD Board**

Christine is an Associate Director at Wardell Armstrong LLP working as a Geo-Environmental and Environmental Auditor with more than 15 years of experience in Environmental Management in the International Mining and Metallurgical Industry. She is an Accredited Lead Cyanide Auditor with the International Cyanide Management Institute (ICMI), for the gold mining industry. Many of her projects have also included aspects of Health and Safety, Hazop, Emergency Response procedures. She has also worked on sensitive political, social and economic studies where interaction with interested stakeholders were complex (e.g. State Governor, Government Ministers, mining unions, etc.). Christine is a Fellow and Vice President of IOM3.



**Darryn Quayle, Mining Engineer and Business Specialist, DIT**

Darryn graduated with a Bachelor's Degree in Mining from the Western Australian School of Mines. He progressed from graduate mining roles through to senior management positions in underground and open pit operations with KCGM. He worked with Orica in Western Australia, New Zealand and as a Marketing Manager for Europe, Africa and the Middle East. Moving to the UK, Darryn has held several positions and is currently HMG's mining engineer and critical minerals expert working to secure an assured supply of critical raw materials for the UK's Industrial Strategy whilst driving initiatives in decarbonising the global mining sector and reducing its environmental impact.



**Andrew Clark, Energy Sector Programme Lead, North East LEP**

Andrew commissioned the mine energy white paper 'The Case for Mine Energy – unlocking development at scale in the UK'. The white paper was developed by the North East Local Enterprise Partnership (North East LEP) and funded by Department for Business, Energy and Industrial Strategy (BEIS), the North East, Yorkshire and Humber, and Midlands Energy Hubs, and the MCS Charitable Foundation. With some of UK's largest mine energy projects being developed in the North East, it made sense for Andrew's team to lead the exploratory work in this area. Building on the Energy for Growth programme, and with the support of other LEPs in the North East and Yorkshire and the Local Energy Hub network, he was instrumental in convening a Mine Energy Taskforce.



**Dr Stephen Henley, Owner, Resources Computing International Ltd**

After doctoral research at Nottingham University, on geology and geochemistry in Cornwall, and 10 years with geological surveys in Australia and the UK, he co-founded the Datamine mining software group in 1981, growing it to a market-leading international provider of geological modelling and mine planning software, for which he received the Aberconway Medal of the Geological Society. In 1993 he left Datamine, to provide independent consultancy and contract research services. This included a year at CSIRO in Western Australia, and several years as an independent adviser to the board of Petropavlovsk plc, one of Russia's largest gold-mining companies. He is now a participant in EU-funded projects developing robotic applications for the minerals industry, a trustee of the Ecton Mine Educational Trust, and current president of the International Raw Materials Observatory.

**Steve Reece, Head of Siting, Radioactive Waste Management Ltd**



Steve Reece is a Chartered Mining Engineer and over the last 25 years Steve has specialised in the field of using underground void space for storage and disposal. Steve initially worked in the South Wales and Durham coalfields where he held a number of supervisory and mine management positions. He then became Mine Manger at Winsford Rocksalt Mine and was instrumental in developing new business to use the underground space created by the room and pillar mining method. These included a document archive storage business and the UK's first underground hazardous waste repository. Over the last 10 years Steve has focused on the strategic use of underground space and has worked on the UK's Geological Disposal Programme for Higher Activity Radioactive Waste. He has also spent time in Australia working on feasibility studies for geological disposal facilities for hazardous wastes and in Canada and Scandinavia working on mine backfill systems.





**Tom Chaplin, PR & Communications Manager, Port of Blyth**

Tom is a communications specialist with a passion for finding and sharing engaging company stories and using modern methods to attract customers and develop brand recognition. He is experienced in public relations, marketing & comms strategy, branding, social media and events. Tom is a graduate of the Newcastle University Business School, having studied for a Master's Degree in Arts, Business & Creativity and passing with a merit. Previously a freelance scriptwriter and director in broadcast media and theatre, Tom has over twenty years of experience in communications, managing and delivering creative projects, team leadership and project management.



**Colin Lambert, Project Manager, The Coal Authority**

Colin is a Project Manager within the Coal Authority's Innovation, By-Product and Services Delivery Team. After studying Civil Engineering at Sheffield Polytechnic, he spent 25 years in Opencast Coal Mining. His expertise in the delivery of large earthworks and land reclamation projects led him to become involved in challenging brownfield re-development opportunities, including reclamation of the former Bates Colliery Site and the former Avenue Coke Works Site. For the past 3 years, he has managed the installation and operation of renewable energy installations, such as the 0.5 MW solar farm at Bates Mine Water Treatment Scheme and has most recently been involved in initiatives to allow the beneficial re-use of Iron Oxide (Ochre) which is generated at the Authority's water treatment sites.



**Chris Yendell, Project Development Manager, Gravitricity Ltd**

Chris holds a BEng (Hons) degree in Mechanical Engineering with Renewable Energy from the University of Edinburgh and has a passion for continuing to push the growth of the low carbon energy sector. With ten years of experience working both as a consultant and as a developer. He has a broad range of experience in the technical and planning aspects of renewable energy, energy storage and low carbon heat developments. Chris started working for Gravitricity after the second Innovate UK grant of £650,000 was awarded in 2019. His work is currently focused on early full-scale project sites following successful deployment of the company's 250kW concept demonstrator in summer 2021.



**Professor Jon Gluyas, Executive Director, Durham Energy Institute**

Jon is a geologist by training, studying for a first degree in geology (Sheffield) and a PhD in sediment geochemistry at the University of Liverpool. Jon worked in the oil industry for 28 years before returning in 2009 to academia and to Durham University. He is now responsible for research in geoenergy as well as carbon capture and storage. Winner of the Geological Society's Aberconway Medal in 2000 for excellence in applied geology he has a strong publication record which includes the best-selling text book Petroleum Geoscience (2003). Jon's research interest is in fluid rock interactions atypical pressures and temperatures in sedimentary basins and their impact on fossil fuel and geothermal resources.



**Dr Robrecht Schmitz, Director Geology, Mining and Geotechnics, Sibelco**

Robrecht qualified in 2000 with an MSc-Eng in Mining and Petroleum Engineering at Delft University followed by an MSc in advanced studies Geotechnics at the University of Liege. He then completed a PhD in applied science geotechnics also at the University of Liege in 2004. Robrecht has worked for 16 years in the mining industry (head production, head geotechnics, reclamation officer, engineer for fire protection in mines and mine ventilation). Presently, he is Director Geology, Mining and Geotechnics and Head of the Centre of Excellence Mining & Geotechnics, Sibelco. Sibelco is an industrial minerals company with more than 120 extraction sites world-wide (underground mines, clay pits, sand pits, dredging operations, hard rock surface mines). Next to this work, he is one of the Directors of the Underground Mining Institute of the Canadian Institute of Mining and Vice President of the Belgian-Luxembourgian Union of Geologists. His professional qualifications include FNEIMME, MIMMM, Chartered Engineer, Chartered Geologist and a UK Registered Ground Engineering Adviser.



**Lorraine de Germiny, Partner, LALIVE (London) LLP**

Lorraine is a French-American lawyer and partner at LALIVE (London) LLP. Her main area of practice is international arbitration, including commercial and investment treaty arbitration with particular experience in the mining and energy sectors. She has acted as counsel or arbitrator in a number of international arbitral proceedings, either ad hoc (including UNCITRAL) or administered (under the rules of the ICC and ICSID), governed by various procedural and substantive laws. Lorraine regularly advises both mining and energy companies as well as States with regard to complex international disputes. She is also a co-founder of Women in Mining Switzerland.





**Alex Cisneros, Associate Director, Wardell Armstrong International Ltd**

Whilst currently pursuing ongoing PhD studies in Social Philosophy, Alex is a social specialist with more than 12 years of experience working in social, health, and human rights impact assessments, as well as environmental and social due diligences. He is experienced acting as Independent Environmental and Social Consultant (IESC) assessing projects against international standards and practices such as the Equator Principles, IFC Performance Standards, EHS Guidelines, and ILO Conventions, among others. His professional background is focused on international projects in Latin America, West Africa, Central Asia and the Middle East, including projects in the mining, renewable energy, oil and gas, hydropower and infrastructure sectors, among others. He is knowledgeable in stakeholder engagement with Indigenous Peoples, ethnic minorities and intersectional vulnerable groups, specialising in the “S” in ESG.



**Anne Oxley, Technical Director, Brazilian Nickel**

Anne has a BEng degree in metallurgy from Imperial College London is a Fellow of IOM3 and a Chartered Engineer. She held the post of Technology Manager with European Nickel, where she oversaw all the process/metallurgical work throughout EN’s worldwide projects and operations. Her next career move was as Co-Founder & Technical Director of Alyssum Ventures Ltd, which focussed on finding and evaluating nickel laterite deposits that are amenable to heap leaching. The company was dissolved in 2018 in order to allow her to focus on a new company (Brazilian Nickel), where she was one of the co-founders. The company was founded to develop its flagship project, the Piauf Nickel Project in NE Brazil.



**Kevin Sabin, Group MD, TSA Limited**

Kevin has an MBA from Sheffield Business School and holds the professional status as FIMMM, Eur Ing, Chartered Engineer and Chartered Environmentalist. He was Group Electrical Engineer at UK Coal Mining Ltd, then General Manager at Centechnology UK Ltd and subsequently Head of Major Projects at UK Coal Mining Ltd. His next position was Managing Director at BBB UK Ltd before joining Hargreaves, where his career took him from Business Development Manager to Director – Head of Mining Services. He then became Divisional Managing Director of Mining at Tech Search Associates Ltd before taking up his present position in January 2021.



**Norman Jackson, International Management & Mining Consultant**

Norman is an acknowledged authority on mining engineering and industry restructuring including the environmental impacts. After a successful career in mining, he was appointed as Project Team Leader for the privatisation of British Coal Corporation (BCC). Prior to his involvement with BCC privatisation, he was Head of Technical Services for the North East Group of BCC. Since leaving BCC he has had a successful career as an independent international management and mining consultant and has worked in association with many clients over a number of years on projects in the coal industries and related industries throughout the world. A recognised strategic thinker with a proven track record with many and varied clients and has gained a reputation as a highly respected expert witness to the Courts.



**Dr Charlotte Adams, Principal Manager, Mine Water Heat, The Coal Authority**

Charlotte is a hydrogeologist by training and has an interest in water resource assessment and mine water treatment. She has both academic and industrial experience gained whilst working at Newcastle and Durham Universities and also from the renewable energy industry. Abandoned mines have huge potential to decarbonise heat demand. Her current role involves developing the potential for homes, businesses and Local Authorities across the UK. Charlotte was awarded the Aberconway Medal of the Geological Society in 2018.



**Dr Alison Monaghan MBE, Principal Geologist, British Geological Survey**

Alison is science lead for the UK Geoenergy Observatory in Glasgow, an underground laboratory focusing on shallow mine water geothermal and heat storage, environmental change and impact. She is a principal geologist based at the British Geological Survey in Edinburgh. Starting her career as a field geologist and 3D modeller, Alison's role and experience has developed through projects in energy geoscience, urban geology and coalfields, primarily in Central Scotland and offshore UK. She has led multi-disciplinary projects with and for academia, industry and Government. UK Carboniferous basins and using legacy coal mining data are common themes running through Alison's work.





**Alice Mellor, Technical Lead – Chemistry, The Coal Authority**

After completing her undergraduate degree in Environmental Earth Science at Aberystwyth University, Alice undertook a funded research masters partnered with Natural Resources Wales. The study investigated neutral metal mine drainage from an abandoned metal mine in Mid Wales to identify sources and pathways of contamination. She commenced her career at AECOM as a Graduate Environmental Consultant working on a variety of projects before moving to The Coal Authority in 2017. Her current role there uses the knowledge gained during her studies with the applications gained whilst working as an Environmental Consultant focusing on metal mine geochemistry.



**Alan Wilson, Energy Director, Buccleuch**

In 2017, Alan joined the senior management team at Buccleuch from Energos, a supplier of small-scale clean energy recovery from waste plants and technology. Prior to joining Energos, where he was Projects Director, he was head of technical services at Scottish Power Renewables, having originally joined Scottish Power in 1996 after starting his career at John Brown Engineering in Glasgow. In his role, Alan is responsible for Buccleuch's energy developments across its estates in Scotland and England including the proposed 12-turbine Hopsrig Wind Farm on the Eskdale and Liddesdale Estate. He is also responsible for identifying new energy opportunities in areas such as anaerobic digestion and biomass.



**Paul Bradley, Head of Operations, Energy Division, Health and Safety Executive**

Following over 28 years of working as a Mechanical Engineer in the UK underground mining industry, holding senior mine management positions, Paul joined the Health and Safety Executive (HSE) in 2008 as HM Principal Inspector of Mechanical Engineering in the Hazardous Industries Division. He is currently HSE's Head of Operations in the Energy Division with overall regulatory responsibility for Offshore and Onshore Well Engineering Operations (including Net Zero transition aspects), and the Mines, Quarries and Diving Industries. Paul is a Fellow of IOM3 and a Chartered Engineer and a Chartered Scientist. He is a Fellow of the Chartered Management Institute and a Chartered Manager.



**Dr Leigh Sharpe, Licensing & Permissions Manager, The Coal Authority**

Leigh gained his PhD in Geomechanics from CSM, University of Exeter in 1999. After post-doctorate research in tunnelling he moved into consultancy, working as a senior engineer principally on a range of large infrastructure projects. He joined the Coal Authority's Licensing and Permitting team in 2008. Since that time, he has licensed mining activities, regulated the early uptake of minewater heat recovery and safely guided several thousand construction projects impacted by historic mining legacy through the permit process. Leigh currently provides technical advice to customers as part of the Coal Authority's Pre-application Advice Service.



**Russell Hurcombe, Senior Engineering Geologist, GRM Development Solutions Ltd**

Russell graduated from Keele University with a Master's degree in Geoscience. He joined GRM in 2014 as an Assistant Geologist and through subsequent promotions, now works as a Senior Engineering Geologist. Through his experience at GRM, Russell has worked on a multitude of sites to remediate against a variety of geotechnical hazards including quarries, landfills and former mine sites. His current role involves managing site investigations and the follow-on remedial work, providing a reliable and efficient service to clients who wish to develop the sites.



**Dr Stuart Walker, Principal Manager, Mine Heat Licensing, The Coal Authority**

Stuart gained a BSc in Chemistry at the University of Hull before gaining a PhD in Geochemistry at the University of York. He started his career as a teacher before joining UK Coal as a Geotechnical Risk Engineer, then progressing to Company Geologist – Deep Mines. Stuart moved on to British Steel where he managed a team of technical experts. In 2017, he joined The Coal Authority as a Principal Manager and is currently leading and developing the licensing of mine workings for sustainable use. He works with a diverse range of stakeholders to develop the Authority's role to enable the UK to meet its sustainability and de-carbonisation targets. Stuart is a Member of IOM3 and a Chartered Engineer.





### John F Tunnicliffe Medal



Professor JF Tunnicliffe has been an active member of the Council of the Midland Institute of Mining Engineers (MIMinE) for over 50 years and has been a member of the North of England Institute of Mining and Mechanical Engineers (NEIMME) for over 30 years. During this time, he has been heavily involved in both local and national mining institutes holding positions in the Midland Institute of Mining Engineers and was President of The Institution of Mining Engineers (IMinE) 1987-1988. After leaving the mining industry and holding several senior positions, he became a professor and head of the mining departments at Newcastle and Leeds universities, bringing his practical experiences to a great many students during that time.

Due to his outstanding contribution both nationally and locally in institute affairs, his promotion of the mining industry and the development of younger engineers, the Trustees of NEIMME and MIME have established the JF Tunnicliffe Medal to be awarded to young engineers.

### Accreditation

The conference has been Approved for CPD by IOM3. A certificate will be available to delegates at the end of the conference.



### Conference Donation Package

The conference organisers have agreed a package for organisations wish to make a donation to the administration costs and other expenditure associated with holding the event. The Booking Form includes details of the package, which includes delegate fee(s), table top exhibition stand in the general networking area, logo on the conference (NEIMME) website and attribution on all promotional material for the conference.





## Pre-Conference Field Trip

Tuesday, 9 November 2021

**Bates Clean Energy Terminal:** Infrastructure works including a substantially upgraded heavy lift quay and 5 hectares of development land remediation are to be combined with a range of low carbon initiatives and innovation, to meet the needs of the offshore and renewables sector at the modern 17-hectare terminal. These upgrades will support UK Government ambitions set out in the Clean Maritime Plan and 2050 net zero targets whilst also serving the operational needs of the offshore wind industry as it moves to adopt clean maritime technologies and dramatically reduce emissions associated with operation and maintenance.

Specific objectives include zero carbon mine water heating to buildings, port electrification including heavy crange, solar and other renewable power generation, shore-to-ship power, robotics, automation, alternative fuel innovations to support next generation vessels and much more. These exciting initiatives are to be delivered with support from a growing number of regional and national partners.

Narec Distributed Energy is a spin-off company from the UK National Renewable Energy Centre and is a part of the Offshore Renewable Energy (ORE) Catapult, a British technology innovation and research centre for offshore wind power, wave energy, tidal energy and low carbon technologies. The centre operates multi-purpose offshore renewable energy test and demonstration facilities. It is similar to centres such as the National Renewable Energy Laboratory (NREL) in the US and the National Centre for Renewable Energies (CENER) in Spain. During the field trip there will be time for a party of 12 to visit the facility for a brief viewing of some of the facilities. An optional harbour trip



(weather permitting) may be organised. Also, there will be an opportunity to visit the Blyth Tall Ship (The William II), which will be moored at the quayside.

A coach will transport delegates from Neville Hall (10:00 AM) to the Port of Blyth. A tour of the facilities as above will be undertaken and a buffet lunch provided. The coach will return delegates to Neville Hall at the end of the afternoon tour (4:00 PM).

Places on this field trip are limited and will be filled on a first-come first served basis. Delegates participating are reminded to bring winter clothing as the trip has outdoor aspects and stout shoes would be beneficial. PPE will be provided where required.





**Organisations donating to the conference (as at 1 October 2021)**

North of England Institute of Mining and Mechanical Engineers	
Midland Institute of Mining Engineers	
The Mining Institute of Scotland	
Durham Energy Institute	
The Coal Authority	

**Others donating to the conference**

Sir John and Lady Mae Hall



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Conference 2021

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