



THE UNIVERSITY
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Queensland
Government

Australian Mine Waste Symposium

Event program



Welcome from co-chairs

On behalf of the Symposium organising committee we are delighted to welcome you to the inaugural Australian Mine Waste Symposium (AMWS).

The status quo of mine waste management needs to be challenged. With demand for energy transition minerals growing, an array of new mineral exploration and mining operations are in the pipeline, but a key question remains unanswered: how will the associated mine waste be managed to minimise risks?

Should we continue to place waste materials into purpose built structures or dams or strive to apply circular economy principles and search for opportunities to valorise them, thereby reducing the industry's vast waste footprint?

This two-day symposium will tackle this topic and more, unpacking the challenges and opportunities associated with mine waste management. Our 4 themes – From valorisation to sequestration; mining and reprocessing pathways; barriers to success; and the future landscape – will comprehensively cover the topic, which in recent times has expanded significantly due to new ideas and technologies. You will hear about the latest research and practice around the secondary prospectivity of mine waste, how new technologies are helping to overcome conventional technical challenges, which non-technical challenges still need to be addressed, how our industry can learn from the practices of other industries dealing with waste, and more.

We are particularly excited for these distinct topics to be connected at the final interactive workshop, where all delegates will have an opportunity to shape the discussion. From this workshop, we hope to produce a white paper that will provide a best-practice roadmap to help reduce our industry's mine waste footprint.

A key aspect of the AMWS will also be providing the next generation with a voice, as, arguably, they will be the ones to deliver the step-changes needed to revolutionize our approach to mine waste. To that end we are proud to be showcasing several early-career researchers and supporting the attendance of several undergraduate students, who we encourage you to engage with.

There is perhaps no more fitting a venue for this event than The University of Queensland's (UQ) Global Change Institute (GCI), – a building constructed with mine waste materials, namely slag and fly ash, to reduce the construction-related carbon footprint. The building's original purpose was to house game-changing research and ideas, and we are confident the spirit of our event will deliver on that vision.

We are very grateful to our colleagues in the Queensland Government's Geological Survey (GSQ) for partnering with us on this event and to our sponsors – their support has allowed us to design an incredible event, which we hope proves valuable for you.

Co-Chairs Australian Mine Waste Symposium



Associate Professor
Anita Parbhakar-Fox



Dr Kam Bhowany

Organising committee

Associate Professor Anita Parbhakar-Fox
Dr Kam Bhowany
Rosie Blannin
Dr Laura Jackson
Dr Tuan Nguyen
Dr Eléonore Lèbre

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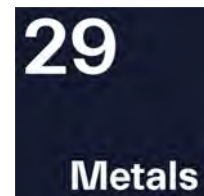


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SEDGMAN

About the Sustainable Minerals Institute

For more than 20 years UQ's Sustainable Minerals Institute (SMI) has been developing the people, technologies and approaches necessary to address the challenges facing the world on the path to sustainability.

To achieve this, SMI adopts a multidisciplinary approach that integrates expertise in geoscience, mining, mineral processing, workplace health, safety and risk, environmental management, social responsibility, and organisational improvement.

Since it was established in 2001, SMI has been the only research institute in the world where this breadth and depth of knowledge can be found in one place.

SMI consists of an International Centre of Excellence in Chile, the technology transfer company JKTech and 6 research centres, each nurturing specific disciplinary strengths. The Institute also leads a set of multidisciplinary strategic research programs which focus on priority challenges in, and relating to, the minerals industry. The researchers and specialists in each of these centres and programs work with industry, governments, civil society, local communities, Indigenous Peoples, inter-governmental organisations, research institutions and foundations.

In addition to research, SMI delivers professional development, higher degrees by research and formal teaching programs to train the next generation of industry and community leaders.

Symposium Information

Name badges

Each delegate will be issued with a name badge at the registration desk. Please wear it at all times during the Symposium.

Catering

Morning tea, lunch, afternoon tea and post event drinks and nibbles are included in the registration fee. Please refer to the program for catering times.

Special dietary requirements will be clearly marked.

Symposium dinner

The symposium dinner is at Customs House, 399 Queen Street, Brisbane, on Tuesday 6 February from 6.30pm – 9.30pm.

Delegates can travel to Customs house via City Cat, Bus or taxi/uber.

Entry to the Symposium dinner is ticketed. Please present your name badge on arrival at the venue as it will have an additional icon to indicate your registration for the dinner.

Recording

Please do not video, audio or digitally record any presentation during the Symposium.

Photography

Delegates are advised that photography and filming will occur during the event with footage and images used for marketing and promotional purposes. Please speak to events staff if you do not consent to being filmed or photographed.

UQ Guest Wifi

Guests have different options to access the internet when visiting a UQ campus. Guests are able to access wireless internet on campus using 'UQ Guest'. Guests can connect to the network by signing in with their Gmail, Facebook or LinkedIn accounts (similar to other free wifi services).

Speakers



Plenary Speaker: Professor Veena Sahajwalla

Tuesday 6 February, opening session

Professor Sahajwalla is an internationally recognised materials scientist, engineer, and inventor revolutionising recycling science. She is renowned for pioneering the high temperature transformation of waste in the production of a new generation of 'green materials' at the University of New South Wales Sustainable Materials Research and Technology (SMaRT) Centre, where she is Founding Director.

Professor Sahajwalla is the inventor of polymer injection technology, known as green steel, an eco-friendly process for using recycled tyres in steel production. In 2018, she launched the world's first e-waste MICROfactory™ and in 2019 launched her plastics and Green Ceramics MICROfactories™, a recycling technology breakthrough.

Professor Sahajwalla is the director of the Australian Research Council (ARC) Industrial Transformation Research Hub for 'microrecycling', a leading national research centre that works in collaboration with industry to ensure new recycling science is translated into real world environmental and economic benefits. She has also been appointed hub leader of the National Environment Science Program's Sustainable Communities and Waste Hub.

In 2021, Professor Sahajwalla featured in the ABC's Australian Story, and she was named the 2022 New South Wales Australian of the Year in recognition of her work. Professor Sahajwalla was named the 2022 Australian Museum Eureka Prizes winner for the Celestino Eureka Prize for Promoting Understanding of Science and was also awarded the Australian Academy of Technology and Engineering (ATSE) Clunies Ross Innovation Award. In 2023, Professor Sahajwalla was awarded the Engineering Australia Chemical College Chemical Engineer Achievement Award and the Good Design 2023 Women in Design Award.

Speakers



Speaker Theme 1
Valorisation to Sequestration
Professor Greg Dipple

Professor Dipple is the Head of Science and a Co-Founder of Arca Climate Technologies. He is also a Professor of Geological Sciences at the University of British Columbia in Vancouver, Canada where he has studied mineral-fluid reactions, including those that modulate long-term climate through chemical weathering. For two decades, he has directed the CarbMin Lab which through field, modelling and experimental research has established that weathering of alkaline mine wastes are vastly accelerated over natural weathering rates such that they can impact the short term carbon cycle.

Professor Dipple has held academic leadership roles at the Department and Faculty level, and in industry-oriented research consortia such as the Mineral Deposit Research Unit and the Bradshaw Research Institute for Minerals and Mining. He is currently on leave from the University to focus advancing the commercialization of carbon mineralization with Arca Climate Technologies. awarded the Engineering Australia Chemical College Chemical Engineer Achievement Award and the Good Design 2023 Women in Design Award.



Speaker Theme 2
Mining and Reprocessing Pathways
Kevin MacNeill

Kevin was appointed Chief Executive Officer of EQ Resources in March 2021 following on from his position as the Company's Interim-Chief Executive Officer and Senior Technical Advisor from May 2020.

Kevin's 30-year career has been dedicated to the development and operation of resource projects, from discovery, feasibility study stage to mining and minerals processing operations. He has held various managing director appointments including President of Etruscan Diamonds (part of TSX-listed Etruscan Resources), and has founded Specialized Metallurgical Projects Pty Ltd, an engineering consulting and project development company, focusing on metal recovery and mining waste processing projects.

As EQ Resources Chief Executive Officer, Kevin is focused on the day-to-day site operations at Mount Carbine as well as overseeing the assessment of the Company's project portfolio to outline a strategic roadmap for the Mount Carbine developments and EQ Resource's other expansion and exploration activities.

Speakers



Speaker Theme 3
Barriers to Success
Ashleigh Morris

As the Chief Executive Officer of Coreo, Ashleigh is catalysing the transition to a circular economy. Coreo's dynamic team has delivered hundreds of highly impactful projects across a broad range of industries and supply chains, including the largest producers and consumers of metals.

Ashleigh drives strategy and execution of initiatives to create value across the life-cycles of iron ore, metallurgical coal, copper, aluminium and other critical minerals, for global clients like Fortescue, Anglo American, BHP, Rio Tinto, South32, Alcoa, the Aluminium Council of Australia and the Australian Government.

Globally recognised for her circular economy leadership, Ashleigh is a member of the AusIMM ESG Advisory Council, and a responsible mining expert with working groups for the Initiative for Responsible Mining Assurance (IRMA) and The Copper Mark Chain of Custody. She holds advisory roles across mining, textiles and renewable fuels industries, and was a founding Board Member of the Australian Circular Economy Hub.



Speaker Theme 4
The Future Landscape
Leigh Staines

As an Environmental and Chemical Engineer, Leigh has held a range of operational, commercial, project and strategy roles across the international resources sector, including ExxonMobil, Santos and Rio Tinto. She is a passionate advocate towards future-proofing Australian heavy industry and manufacturing and has held tenures as the Manager of the Port Bonython Refinery in South Australia and more recently as the Site General Manager of the Boyne Aluminium Smelters in Gladstone. Leigh sees the energy transition as a foundation for regional economic redevelopment and an increased approach to resource recovery of our critical minerals and metals.

Having completed assignments across Australia, the United States of America, Canada, the United Kingdom, Singapore and Papua New Guinea, Leigh applies a truly global perspective to her work. She particularly enjoys leading teams to execute strategic plans into the delivery of tangible business outcomes. After representing Australia in 2001 at the Youth Environmental Summit in Switzerland, she is excited to see, over 20 years on, that evolving society expectations combined with government regulatory changes may be the catalyst for achieving a 'green' economy at scale.

Leigh is currently an Industry Professor at The University of Queensland's Sustainable Minerals Institute.

Program Day 1

6 February

A book of abstracts of the presented research at the Symposium can be found [here](#)

8:30am – 9:00am	Arrive / Register	
9:00am – 9:30am	Conference opening	
9:30am – 10:10am	Plenary address	Professor Veena Sahajwalla, Director, University of New South Wales Sustainable Materials Research and Technology (SMaRT) Centre
10:10am – 10:30am	Morning Tea/Posters	

Theme 1 | Valorisation to Sequestration

Session chair: Rosie Blannin

10:30am – 11:10am	Theme 1 Keynote address	Professor Greg Dipple, Head of Science and Co-Founder Arca Climate Technologies
11:10am – 11:25am	Waste to value: addressing the critical metals shortfall	Brock Hill, EnviroGold
11:25 – 11:40am	Geoenvironmental characterisation of the King River Delta: A combined geophysical, geochemical and mineralogical approach	Dr Sibebe Nascimento, SMI WH Bryan Mining Geology Research Centre, UQ
11:40am – 11:55am	Rare earth elements as potential by-products of alumina production from bauxite deposits in Samar, Philippines	Dr Maria Cristina Vegafria, Mindanao State University-Iligan Institute of Technology
11:55am – 12:15pm	From “earth” to “earth” principle and technology to tackle global tailings challenges	Professor Longbin Huang, SMI Centre for Mined Land Rehabilitation, UQ
12:15pm – 12:30pm	<i>Q and A for ALL SPEAKERS</i>	
12:30pm – 1:30pm	Lunch/Posters	

Theme 2 | Mining and Reprocessing Pathways

Session chair: Dr Laura Jackson

1:30pm – 2:00pm	Theme 2 Keynote address	Kevin MacNeill, CEO EQ Resources
2:00pm – 2:15pm	Assessing phosphate mine tailings recovery potential through spatial modelling of geochemical and mineralogical data	Kaoutar Erraihani, University Mohammed VI Polytechnic
2:15pm – 2:30pm	The geomicrobiology of metal extraction; next steps for industrial scalability	Professor Gordon Southam, UQ School of the Environment

Program Day 1

6 February

2:30pm - 2:45pm	The RIMM process: the potential for mine waste valorisation and solving environmental issues on the mine sites	Henry Sukhinin, InnovEco / University of South Australia
2:45pm - 3:00pm	Copper extraction potential from tailings and waste deposition in the CSA mine, New South Wales, Australia	Dr German Figueroa, Metals Acquisition Limited
3:00pm - 3:15pm	<i>Q and A for ALL SPEAKERS</i>	
3:15pm - 3:45pm	Afternoon Tea/Posters	
3:45pm - 4:30pm	Panel Session, moderated by Associate Professor Anita Parbhakar-Fox	Dr Simon Johnson (Geological Survey of Western Australia), Jane Thorne (Geoscience Australia), Dr Janelle Simpson (Geological Survey of Queensland), Dr Helen Degeling (Cobalt Blue), BHP (representative - TBA), Prof. Sara Couperthwaite (Queensland University of Technology), Jon Loraine (Core Resources)
4:30pm - 5:30pm	Poster session and drinks	
<i>Own time - recommended travel to dinner in Brisbane CBD</i>		
6:30pm - 9:30pm	Symposium Dinner	The Long Room, Customs House

Program Day 2

7 February

Theme 3 | Barriers to Success

Session chair: Dr Eléonore Lèbre

9:00am – 9:30am	Theme 3 Keynote address	Ashleigh Morris – Coreo
9:30am – 9:45am	Finding value while managing risks of mining wastes	Dr Corinne Unger, UQ Business School
9:45am – 10:00am	Overcoming barriers to mine waste valorisation through biotechnology	Dr Ka Yu Cheng, CSIRO
10:00am – 10:15am	Addressing Mine Legacy Issues for Reprocessing Gold Tailings – A Case Study	Joel Eadie, ATC Williams
10:15am – 10:30am	Mount Morgan Mine – Challenges to Remining the Historic Mine Wastes	Russell Dann, Heritage Minerals
10:30 – 10:40am	<i>Q and A for ALL SPEAKERS</i>	
10:40am – 11:00am	Morning Tea/Posters	

Theme 4 | The Future Landscape

Session chair: Dr Tuan Nguyen

11:00am – 11:30am	Theme 4 Keynote address	Industry Professor Leigh Staines – SMI, UQ
11:30am – 11:45am	Extracting predictive environmental indices for Queensland's ore deposits derived from hylogger spectroscopic logging and analyzer XRF drillcore scanning	Enrique Salgado, SMI WH Bryan Mining Geology Research Centre, UQ
11:45am – 12:00pm	Manufacturing building blocks using mining waste	Blake Stacey, Real Material Solutions
12:00pm – 12:15pm	Tailings valorisation – drivers for commercial viability	Bernadette Currie, Sedgman
12:15pm – 12:30pm	Managing mining legacies: a new global standard	Dr Corinne Unger, UQ Business School
12:30pm – 12:40pm	<i>Q and A for ALL SPEAKERS</i>	
12:40pm – 1:35pm	Lunch/Posters	

Program Day 2

7 February

Early Career Researcher Showcase

Session chair: Dr Kam Bhowany

1:35pm - 1:40pm	Looking to the future (video message)	Professor Iain Stewart MBE, earth scientist and broadcaster Jordan – UK El Hassan bin Talal Research Chair in Sustainability, Royal Scientific Society Jordan
1:40pm – 1:45pm	How X-ray Absorption Spectroscopy can help to assess the resource potential of mine waste	Dr Jessica Hamilton, Australian Synchrotron (ANSTO)
1:45pm – 1:50pm	Geometallurgical opportunities for cobalt recovery from tailings	Loren Nicholls, SMI WH Bryan Mining Geology Research Centre, UQ
1:50pm – 1:55pm	Unlocking Critical Metals in mine wastes: Potential for bismuth, indium, cobalt and more in Tasmania	Dr Owen Missen, University of Tasmania
1:55pm – 2:00pm	Analysis of tailings from facilities in Victoria and New South Wales	Ryan Grant, RMIT University
2:00pm – 2:05pm	3D Geostatistical modelling for estimating the resource potential of tailings storage facilities	Rosie Blannin, SMI WH Bryan Mining Geology Research Centre, UQ
2:05pm – 2:10pm	Alternative mineral processing strategies for copper- gold tailings management	Roneel Narayan, SMI Julius Kruttschnitt Mineral Research Centre, UQ
2:10pm – 2:15pm	Indium cycling and mobility in mine waste and acid mine drainage environments	Olivia Mejías, SMI WH Bryan Mining Geology Research Centre, UQ
2:15pm – 2:20pm	Numerical Modelling Challenges in Mining Waste Management	Dr Juan Felipe Giraldo, CSIRO
2:20pm – 2:25pm	Recycling mine waste: opportunities for Mount Gunson	Lina Toben, University of Adelaide/ UQ
2:25pm – 2:30pm	Towards a case for the economic feasibility of concurrent mineral carbonation and metal recovery	Samuel Keller, University of Western Australia
2:30pm – 3:00pm	Afternoon Tea/Posters	
3:00pm – 4:15pm	Workshop: <i>What are the challenges and opportunities for reprocessing mine waste and what can be done to make it routine practice?</i> led by Associate Professor Anita Parbhakar-Fox	Round table talks, moderated by Dr Laura Jackson, Rosie Blannin, Dr Eléonore Lèbre and Dr Tuan Nguyen.
4:15pm – 4:30pm	Close and final remarks	
4:30pm – 5:30pm	Networking and drinks / nibbles	

Poster Presentations

Presenter	Title
Theme 1 Valorisation to sequestration	
Gabriele Baldassarre, Politecnico di Torino	Mine Waste as a Possible Source of Strategic and Critical Raw Materials: Advancing the Knowledge for some Case Studies in Italy.
Francesco Colombi, SMI WH Bryan Mining Geology Research Centre, UQ	Arsenic Distribution, Speciation and Mobility in Loddon River Legacy Deposits
Dr Jessica Hamilton, ANSTO Australian Synchrotron	How X-Ray Absorption Spectroscopy can Help to Assess the Resource Potential of Mine Waste
Dr Andrew Kostryzhev, UQ	AMICS: Novel Automated Mineralogy System
Olivia Mejías, SMI WH Bryan Mining Geology Research Centre, UQ	Indium Cycling and Mobility in Mine Waste and Acid Mine Drainage Environments
Dr Maria Cristina Vegafria, SMI Centre for Mined Land Rehabilitation, UQ	A Conceptual Geochemical Model of Mary Kathleen Tailings Storage Facility in View of Risk Assessment and Element Recovery
Lina Toben, University of Adelaide/UQ	Recycling Mine Waste: Opportunities for Mount Gunson
Le K'ng, SMI WH Bryan Mining Geology Research Centre, UQ	Discover Future Re-Use Options for Mine Waste via Characterisation in New South Wales, Australia
Samuel Keller, University of Western Australia	Towards a Case for the Economic Feasibility of Concurrent Mineral Carbonation and Metal Recovery
Dr Paul Evans, SCMB - ACE	In silico Discovery of Critical Mineral Binding Proteins for Mining Applications
Rosie Blannin, SMI WH Bryan Mining Geology Research Centre, UQ	Mine Waste Sampling and Characterisation in Western Australia
Dr Allan Gomes, SMI WH Bryan Mining Geology Research Centre, UQ	Mine Waste Sampling and Characterisation in the NT, Australia
Dr Laura Jackson, SMI WH Bryan Mining Geology Research Centre, UQ	Critical Metal Potential of South Australia's Mine Waste
Associate Professor Anita Parbhakar-Fox, SMI WH Bryan Mining Geology Research Centre, UQ	Identifying resources of critical metals in Queensland's mine wash - the 'MIWATCH' approach

Poster Presentations

Presenter	Title
Theme 2 Mining and reprocessing pathways	
Cameron J. Johnston, Queensland University of Technology	Critical mineral recovery from acid mine drainage using hydrochloric acid processes
Roneel Narayan, SMI Julius Kruttschnitt Mineral Research Centre, UQ	Alternative mineral processing strategies for copper – gold tailings management
Dr Juan Giraldo, CSIRO	Numerical Modelling Challenges in Mining Waste Management
Dr Owen Missen, University of Tasmania	Unlocking Critical Metals in mine wastes: Potential for bismuth, indium, cobalt and more in Tasmania
Dr Andrew Langendam, Australian Synchrotron, (ANSTO)	Have you got the good stuff? How Synchrotron X-Ray Fluorescence Microscopy can be used to analyse mine waste
Rosie Blannin, SMI WH Bryan Mining Geology Research Centre, UQ	3D geostatistical modelling for estimating the resource potential of tailings storage facilities
Loren Nicholls, SMI WH Bryan Mining Geology Research Centre, UQ	Geometallurgical opportunities for cobalt recovery from tailings
Ryan Grant, RMIT University	Analysis of tailings from facilities in Victoria and New South Wales
Igor Babaian, UQ	Experimental study of leachability of amorphous PbO-CuO-FeO-SiO ₂ slag: development of methodology and initial results
Luke Webster, UQ	Protein identification for binding of critical elements in bauxite residue
Theme 3 Barriers to success	
Michael Ingwersen, Circular Mine Pty Ltd	Understanding the True Costs of Tailings Management for meaningful comparisons with alternative solutions
Nicolau Barros, Regeneration Enterprises	A re-mining-restoration solution for abandoned mine sites
Theme 4 The future landscape	
Marlo Lyda, Designer-maker	Reimagining Beauty: Repurposing Mine Waste for Sustainable Design and Artistry
Chamari Naidelage, GSQ	Circular economy opportunities across the lifecycle of the resources sector
Ashraf Khalifa, SLR Consulting Australia Pty Ltd	Using rainfall simulators to design and assess the post-mining erosional stability
Michael Ingwersen, Circular Mine Pty Ltd	Why repurposing tailings is the future of mining

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