

TECHNICAL COURSES PRIOR TO SUSTAINABLE MINING 2025

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Time Zone Santiago, Chile. GMT -3 | English-Spanish Interpretation Available in all Technical Sessions

Thursday, May 8

PRE-CONGRESS ACTIVITIES

ONLINE

Virtual Technical Courses | Free Access for Congress Participants

17:00 –
19:00

ENG

**Life Cycle Assessment: An Overview With An Emphasis On
Critical Minerals Mining**

Jennifer Dunn and Jenna Trost, Northwestern University, USA

Northwestern
University

Friday, May 9

PRE-CONGRESS ACTIVITIES

ONLINE

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SPA

10:00 –

**Conservation and Restoration of High Andean Ecosystems:
Opportunities and Challenges for the Mining Industry**



13:00

Jacques Wiertz, Environmental Rehabilitation and Ecosystem Dynamics Team Leader, SMI-ICE-Chile, University of Queensland, Australia

SMIICEChile

SPA

15:00 –

Progress towards Circularity in the Mining Industry



18:00

Luis Cisternas, Yesica Botero, Pía Hernández, Marco Vargas and Walter Blanco; Academics and Researchers, Universidad de Antofagasta, Chile

CURSO 1: LIFE CYCLE ASSESSMENT: AN OVERVIEW WITH AN EMPHASIS ON CRITICAL MINERALS MINING

Northwestern
University

When: Thursday, May 8 | 17:00 - 19:00

Presenters: Jennifer Dunn and Jenna Trost, Northwestern University, EE.UU.

Language: Inglés

Length: 2 hours

Description: Participants will learn about the four stages of LCA and how they can be applied to mining. They will learn about data choices in LCA and methodological choices such as co-product handling.

GENERAL OBJECTIVES

- Gain familiarity with the four stages of LCA and how they apply to LCAs of mining (focus on critical minerals).
- Gain experience carrying out beginning LCA calculations; explore data sources for mining.

CONTENT AND PROGRAMME

17:00 - 17:50	Life cycle assessment: Introduction, key steps, and relation to mining	Jennifer Dunn and Jenna Trost
17:50 – 18:00	Questions and discussion	
18:00 - 18:10	Break 1	
18:10 - 18:40	Life cycle assessment: Data, calculations, methodological choices	Jennifer Dunn and Jenna Trost
18:40 – 18:50	Questions and discussion Module 2	
18:50-19:00	Conclusions and Close of Course	Jennifer Dunn and Jenna Trost

LECTURERS BIO

Jennifer Dunn:



Jennifer Dunn is a Professor of Chemical Engineering at Northwestern. She directs the Center for Engineering Sustainability and Resilience. Her research group evaluates the sustainability and cost competitiveness of emerging energy, material, and water systems. Jennifer currently leads the Midwest Nuclear Direct Air Capture Hub (MINDAC) and a Global Center for a sustainable, resilient, and responsible global minerals supply chain. Jennifer has served on two National Academies committees, contributing her expertise on life cycle assessment for the evaluation of sustainable fuels and carbon capture and utilization technologies. At Northwestern, she teaches the capstone senior Chemical Engineering design course and a popular life cycle assessment course. She has also led two undergraduate engineering treks to Chile for students to learn about efforts in the mining industry to become more sustainable and to experience Chilean culture. Jennifer's PhD is in Chemical Engineering from the University of Michigan. Prior to joining Northwestern, Jennifer spent time in government, in consulting, and at Argonne National Laboratory..

Jenna Trost:



Jenna Trost is a Doctoral Candidate in Chemical and Biological Engineering at Northwestern University. Her research explores life cycle assessment methodology development for critical minerals mining and the effects of climate change on mining. Jenna and Jennifer co-taught a life cycle assessment workshop at the Joint Undertaking for an African Materials Institute in 2023 at the University of Nairobi. Jenna has also served as teaching assistant for the life cycle assessment course at Northwestern. Jenna's undergraduate degree is in Chemical Engineering from the University of Colorado at Boulder.

CURSO 2: CONSERVATION AND RESTORATION OF HIGH-ALTITUDE ANDEAN ECOSYSTEMS: OPPORTUNITIES AND CHALLENGES FOR THE MINING INDUSTRY



SMIICEChile

When: Friday, May 9 | 10:00 - 13:00

Presenters: Jacques Wiertz, Team Leader of Environmental Rehabilitation and Ecosystem Dynamics, SMI-ICE-Chile, University of Queensland

Language: Spanish

Length: 3 hours

Description: This workshop focuses on the conservation and restoration of high-altitude Andean ecosystems, particularly wetlands, which are essential for ecosystem services but highly vulnerable. Through the presentation of experiences and case studies from northern Chile, effective strategies for the restoration of these ecosystems will be discussed, along with the importance of collaboration with local communities. Additionally, challenges and opportunities for the mining industry in conserving these ecosystems will be addressed, promoting an interdisciplinary approach to ensure their resilience against anthropogenic impacts and climate change.

GENERAL OBJECTIVES

- Analyze and discuss strategies for the conservation and restoration of high-altitude Andean wetlands: Explore approaches and practices based on case studies and successful projects from northern Chile.
- Promote intersectoral collaboration in the sustainable management of high-altitude Andean ecosystems: Encourage the exchange of experiences and knowledge among key stakeholders, including communities, the mining industry, and academia.
- Identify challenges and opportunities for the mining industry in the conservation of high-altitude Andean ecosystems: Through a discussion panel, evaluate the impacts of mining and propose innovative and practical solutions to mitigate negative effects while ensuring the resilience of wetlands.

CONTENT AND PROGRAMME

10:00 - 10:15	Welcome Remarks	Douglas Aitken
10:15 - 10:40	Keynote Presentation	Jacques Wiertz
10:40 - 11:20	Case Studies – Block 1	3 specialists representing academia, industry, and regulatory institutions
11:20 - 11:25	Questions	Audience
11:25 - 11:40	Break	
11:40 - 12:20	Case Studies – Block 2	3 Experts representing academia, industry, and regulatory institutions
12:20 - 12:25	Questions	Audience
12:25 - 12:55	Discussion Panel	4 Experts representing academia, industry, and regulatory institutions
12:55 - 13:00	Closing Remarks	Jacques Wiertz

LECTURERS BIO

Dr. Jacques Wiertz:



Jacques has an undergraduate degree in civil engineering and geology from Université de Liège, Belgium, and a PhD – Doctorat en Sciences Appliquées from the same university. He has over 25 years of experience in the mining industry as a research engineer, scholar and consultant, committed to sustainability. His main areas of expertise are biohydrometallurgy/bioleaching, environmental impact assessment studies for mining projects, mine closure planning, water management, geochemical characterization of mine waste and chemical stability of tailings deposits.

CURSO 3: PROGRESS TOWARDS CIRCULARITY IN THE MINING INDUSTRY



When: Friday, May 9 | 15:00 - 18:00

Presenters: Luis Cisternas, Yesica Botero, Pía Hernández, Marco Vargas and Walter Blanco, Universidad de Antofagasta, Chile

Language: Spanish

Length: 3 hours

Description: This course focuses on how the mining industry is moving towards sustainability and circularity.

CONTENT AND PROGRAMME

15:00 - 15:15	Challenges for Circularity in the Mining Industry	Luis Cisternas
15:15 - 16:00	Strategies to avoid acid mine drainage from mine tailings	Yesica Botero
16:00 - 16:45	Recovering metals from mine tailings with sustainable methods	Pía Hernández
16:45 - 17:15	How to measure circularity in mineral processing	Marco Vargas
17:15 - 18:00	Recovering valuable species from anode slimes	Walter Blanco