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RAWMINA Project Newsletter #4

Building an integrated,
innovative pilot system for
recovery of critical raw
materials from mine waste



Project News

Twenty-first century mining: Environmental management at Cobre Las Cruces

We are delighted to present this article by *Francisco Sánchez and Angela Cañal (CLC)*

Introduction

Cobre Las Cruces (CLC), situated in the Seville province of Spain across the municipalities of Gerena, Salteras, and Guillena, is a leading example in the global mining industry when it comes

hydrometallurgical process to produce high-quality copper cathodes.



Figure 1. Cobre Las Cruces aerial view

CLC's commitment is based on three pillars of corporate strategy: a) Environmental respect; b) Safety for people; c) Positive Community Engagement.

As a result, efficient and environmentally responsible mine waste management stands as a central focus for the company. CLC places a premium on adopting the best technologies that not only enhance efficiency but also uphold the highest environmental standards.

Within the framework of its Environment Policy, CLC monitors and controls the different environmental impacts that affect the Project. These activities are encompassed in the Monitoring and Control Program conducted by the operation, which has the following objectives:

- Assess the effectiveness of protective and corrective measures implemented across various projects and evaluate the outcomes after their application.
- Verify that the actual environmental impacts align with the initial forecasts.
- Determine the evolution of forecasted impacts based on the assessments conducted during the Environmental Impact Study.
- Control impacts that were challenging to estimate during the initial Environmental Impact Study, such as those arising from restoration or mitigation throughout the Project's lifecycle.
- Define responsibilities for monitoring within CLC's organisational structure and among its contractors.

CLC regularly communicates the results of the Monitoring and Control Program to the Environmental Authority.

The following lines of action, overseen by the CLC Environment Department, provide insights into the environmental control and monitoring activities: Sustainable use of natural resources; Air quality; Water quality; Noise; Residues; Wildlife; Monitoring of compensatory measures; Progressive restoration; Monitoring of land usage.

These filtered tailings are typically transported, deposited, spread, and compacted to create an unsaturated tailings deposit, often referred to as 'dry stack.'

This approach to waste handling minimises the risk of environmental and community impacts associated with unexpected failures in the mine complex. Additionally, this technology allows CLC to engage in progressive rehabilitation efforts on the site. Monitoring indicates that the waste facility management is effectively mitigating long-term risks associated with the site's waste materials.



Figure 2. Cobre Las Cruces Rehabilitation area in process

Furthermore, CLC is actively involved in research and innovation projects aimed at implementing circular economy principles to recover base and critical metals from mine wastes. Notably, CLC plays a significant role in the RAWMINA project:

- As a supplier of waste material for laboratory, bench-scale, and pilot testing.
- As a key partner in integrating various technologies.
- As a leader of a work package dedicated to piloting developed technologies.



Figure 3. Cobre Las Cruces Pilot Plant Facilities

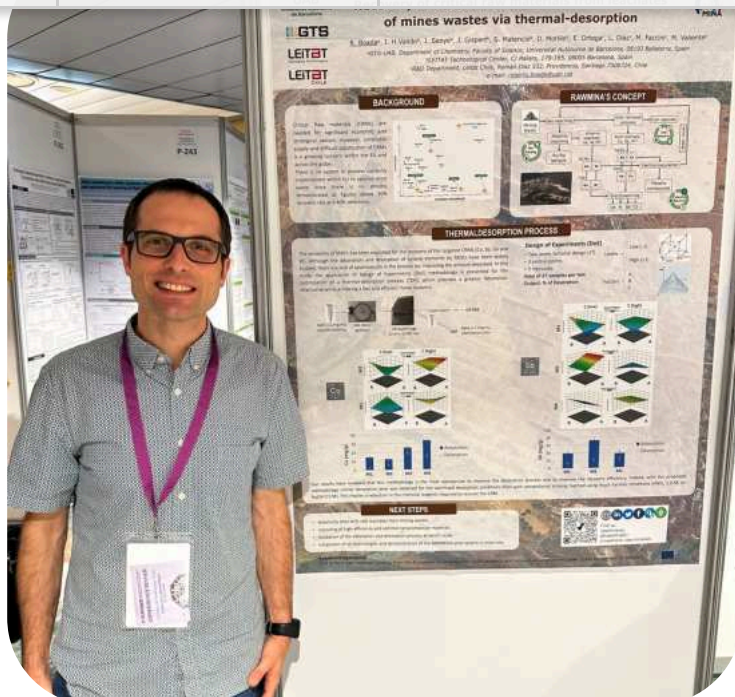
RAWMINA represents a shift from the current linear mine waste processing approach to a sustainable solution based on the principles of the circular economy, considering mine waste as a valuable resource for critical raw materials.

In case you missed us

RAWMINA Partners impact the Critical Raw Materials Industry

RAWMINA partners took part in three prestigious events in September. We are proud to have partners presenting such innovative and important work at these influential conferences and congresses:

1. **EUROMOF 2023** *The 5th European Conference on Metal Organic Frameworks and Porous Polymers in Granada (24-27/09/2023)*

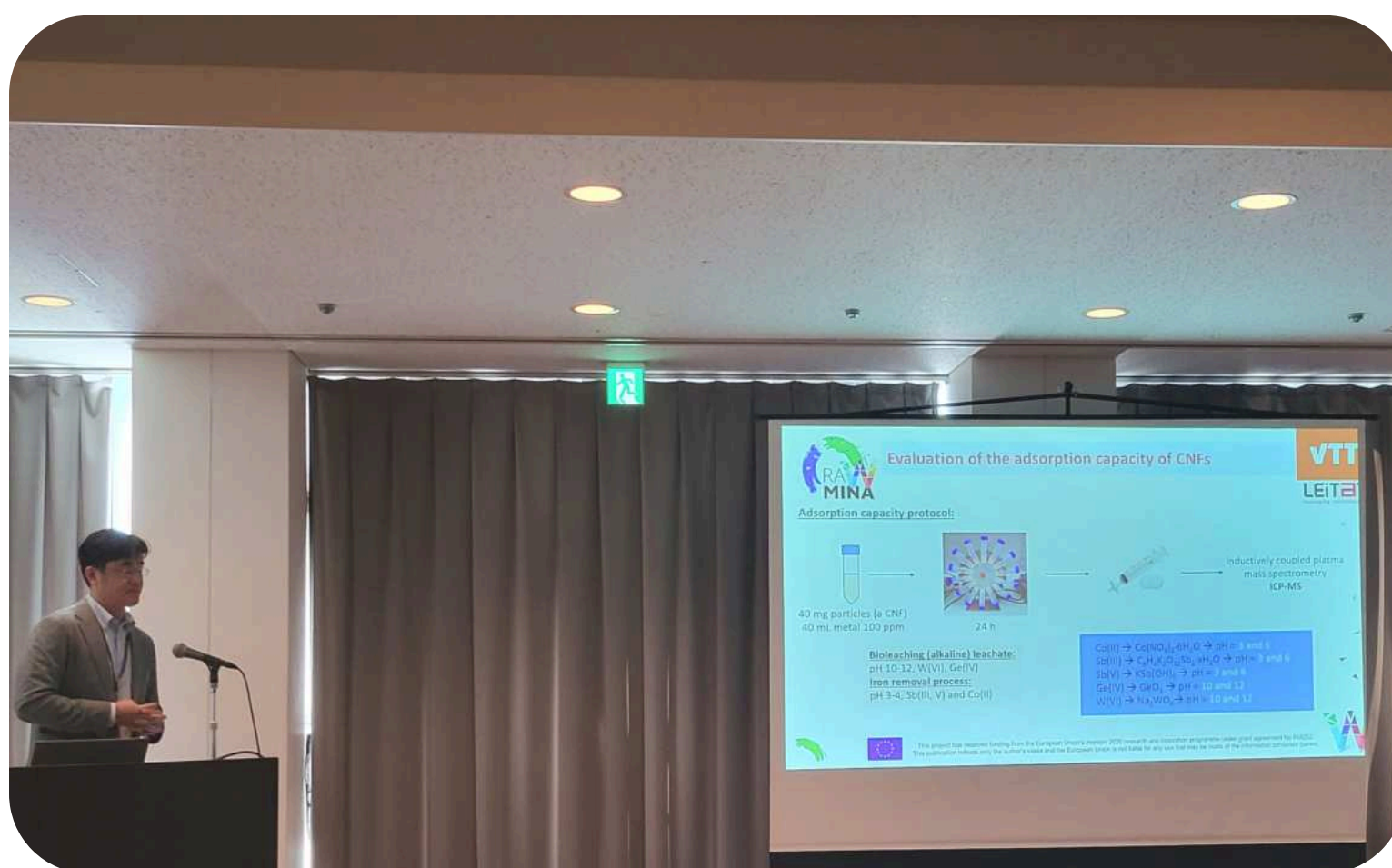


Roberto Boada - Autonomous University of Barcelona at EUROMOF 2023



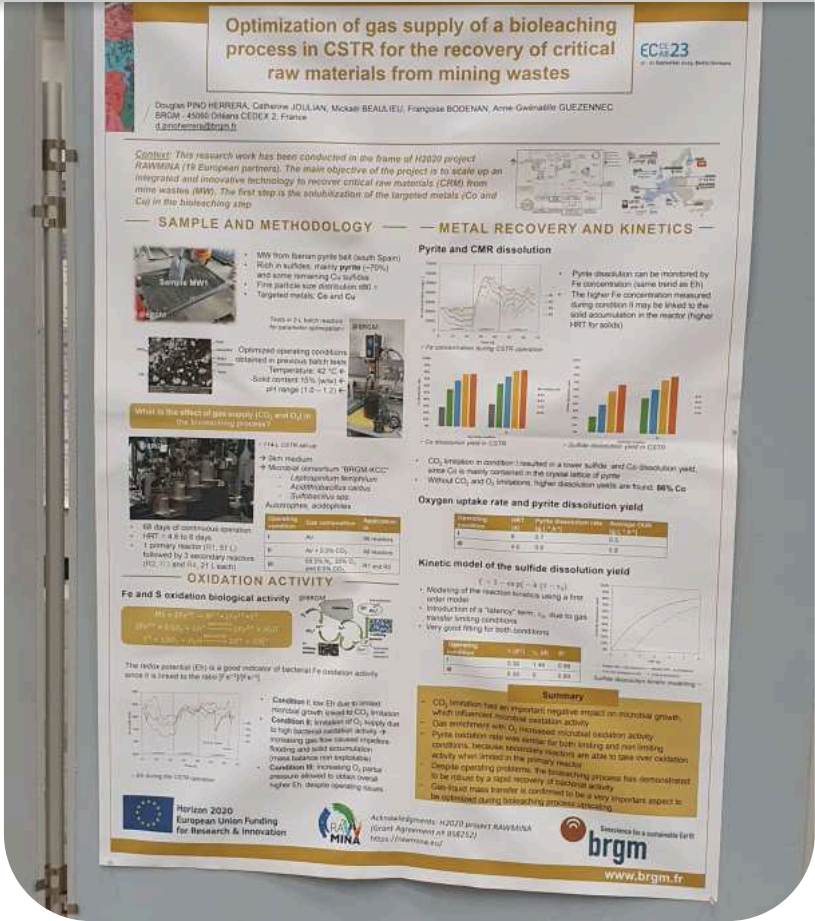
Diego Morillo Martín - Leitat Technological Center at EUROMOF 2023

2. ICC2022+1 *The 5th International Cellulose Conference in Hiroshima (24-27/09/2023)*



Akio Yamamoto (VTT): ‘Just wrapped up an incredible experience at ICC2022+1 in Hiroshima, diving deep into the world of fundamental cellulose science! The conference was ‘exceptionally well-organised, offering a platform to explore cutting-edge research and breakthroughs in the realm of CNF materials.’ And also noted that one of the highlights was ‘the opportunity to connect with potential partners from academia and industry. The exchange of ideas and insights was truly invaluable.’

3. ECCE-ECAB *14th European Congress of Chemical Engineering and 7th European Congress of Applied Biotechnology in Berlin (24-27/09/2023)*



Douglas Pino-Herrera (BRGM) presented the poster *Optimization of gas supply of a bioleaching process in CSTR for the recovery of critical raw materials from mining wastes*. “It was very enriching to discuss with people who discovered RAWMINA and the potential it has in the current context of energy transition and raw material supply and scarcity.”

Coming up

Consortium Meeting in Cork



We are excited to meet up with our consortium partners in Cork for our **30M** Management and Scientific Meeting, taking place 17th to 18th October 2023. This meeting is sure to lead to

Interested in Raw Minerals Innovation?

Raw Minerals Open Innovation Helix



Critical Raw Materials (CRMs) are crucial to Europe's economy, and for the green and digital transitions. They form a strong industrial base, producing a broad range of goods and applications, both current and future.

Research into sustainable, reliable and resilient sources of CRMs and transfer of process technologies into use has never been more important.

Our members are currently targeting opportunities under Cluster 4 of Horizon Europe, seeking international collaborations relevant to the Raw Minerals community

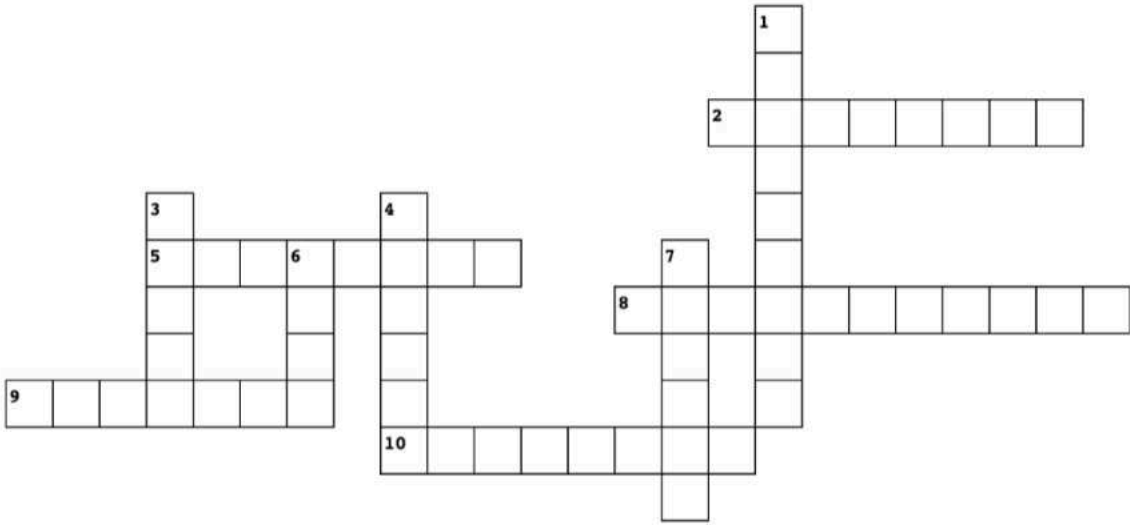
Our community of researchers, technologists, innovators and policy makers continue to be active on the Crowdfelix platform. [Join free as an individual stakeholder from the link on the Helix page!](#) [Organisational memberships are required for some functions].

[Visit and join the Helix!](#)

Try your hand at the RAWMINA crossword

To end this newsletter, we'd like to invite you to enjoy a bit of geological trivia fun - the RAWMINA crossword 😊

Print Share Edit ■ Answers ≡



Across

2. CRM refers to what type of Raw Materials? (8 letters)
5. A silver-coloured, brittle element, used extensively in the electronics industry. (8 letters)
8. The RAWMINA project has received funding from this European Union research and innovation programme. (7 letters, 4 numbers)
9. The RAWMINA project focuses on mines and minerals representative of this peninsula. (7 letters)

Down

1. The first element in the periodic table named after a country. (9 letters)
3. Part of RAWMINA's mine waste valorisation aims is to recycle up to 90% of this precious resource. (5 letters)
4. Essential element for ensuring longer life span of batteries. (6 letters)
6. RAWMINA focuses on removing this mineral by means of magnetic separation. (4 letters)
7. Chile has the world's largest deposits of this mineral ore. (6 letters)

Play

All the answers to the crossword can be found on the RAWMINA project website.



The RAWMINA project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 958252.



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