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OVERVIEW OF THE MORECOVERY PROJECT: MODULAR RECOVERY PROCESS SERVICES FOR HYDROMETALLURGY AND WATER TREATMENT

Morecovery Educational Workshop, May 5th 2020

Teemu Karlsson

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MORECOVERY OVERVIEW

- MORECOVERY is a metal and mineral recovery service at laboratory and/or pilot scale that allows organizations in the raw materials extractive industry to assess whether it is worth recovering metals and minerals from their solid and liquid side streams
- *Service will include preliminary investigations for recovery potential, testing of suitable recovery processes in laboratory and pilot scale, and a tentative feasibility study*
- The main objective of the project is to secure access to critical raw materials for the EU

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MORECOVERY OVERVIEW

- **TO VALIDATE THE SERVICE PACKAGE**, potential extractive waste facilities have been screened and tested in Finland and Spain
- The business opportunities for the Morecovery service package in the extensive go-to-market study are explored

GTK

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MORECOVERY OVERVIEW

- At the end of the project, the modular recovery process services for hydrometallurgy and water treatment are available for mining industry, fully operational and demonstrated





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MORECOVERY OVERVIEW

- **THE PROJECT WILL RESULT** in enhanced use of secondary materials and side streams in raw material production
- Environmental goals will be achieved through cleaner mine waters and decreased amounts of extractive waste containing potentially harmful elements

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MORECOVERY OVERVIEW

Project duration: 01.01.2019-31.12.2021

Total Budget: 1.5 M€

WP0: Go-to Market Strategy (LTU Business)

WP1: Project Management (GTK)

WP2: Development, Learning and Education (GTK)

WP3: Screening potential sites and update of the pilot plant (Savonia AMK, GTK)

WP4: Recovery piloting in lab-scale (UEF)

WP5: Piloting campaigns at target sites (GTK, FMG, Keliber, Savonia AMK)

WP6: Selective metal accumulation by passive AMD remediation (CSIC, UHU)

WP7: Marketing (GTK)

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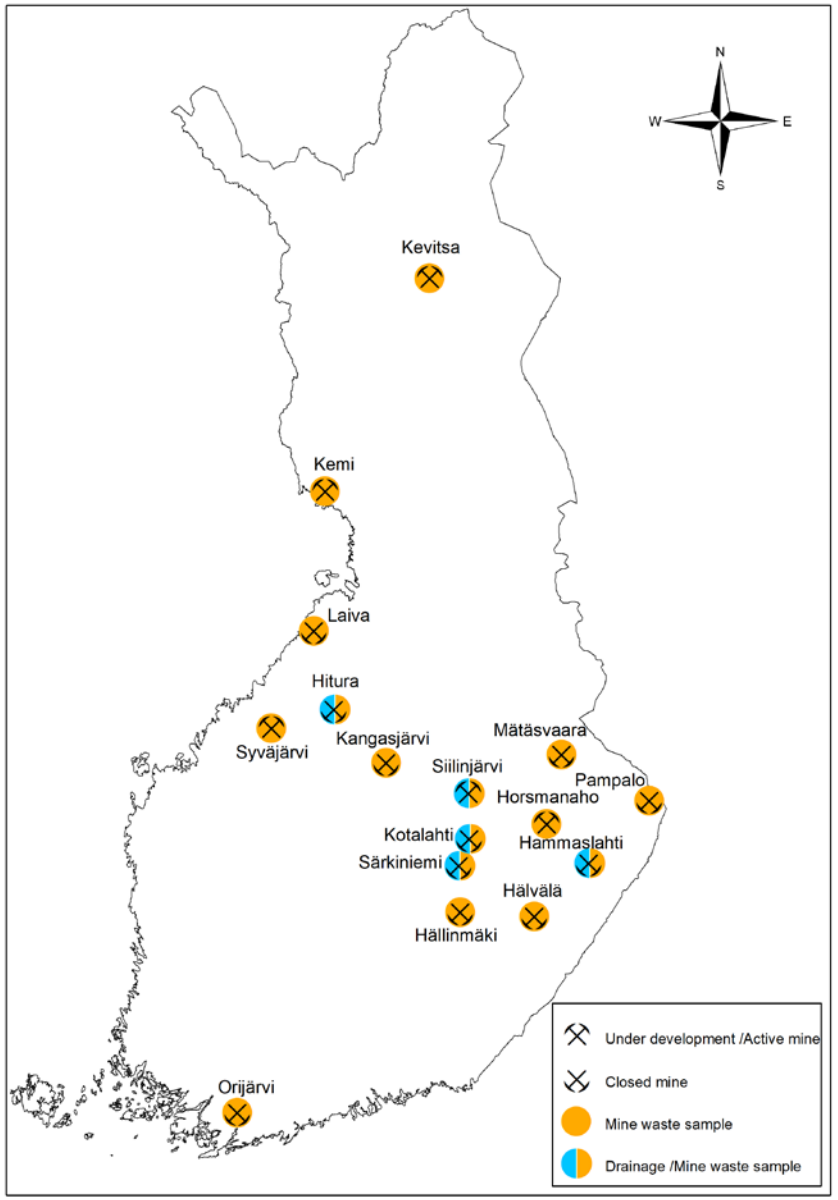
SCREENING AND SAMPLING OF POTENTIAL SITES

- Existing drainage data from 18 potential extractive waste facilities from 10 mine sites has been collected by GTK and analysed by UEF
- Further sampling of mine wastes and drainages from Hitura, Siilinjärvi, Kotalahti, Särkiniemi and Hammaslahti.
- Keliber case sample material produced at GTK Mintec, Outokumpu, Finland
- Tentatively interesting elements for recovery
  - *Hitura: Ni, Co*
  - *Keliber: Nb, Ta*
  - *Siilinjärvi: REE, P*



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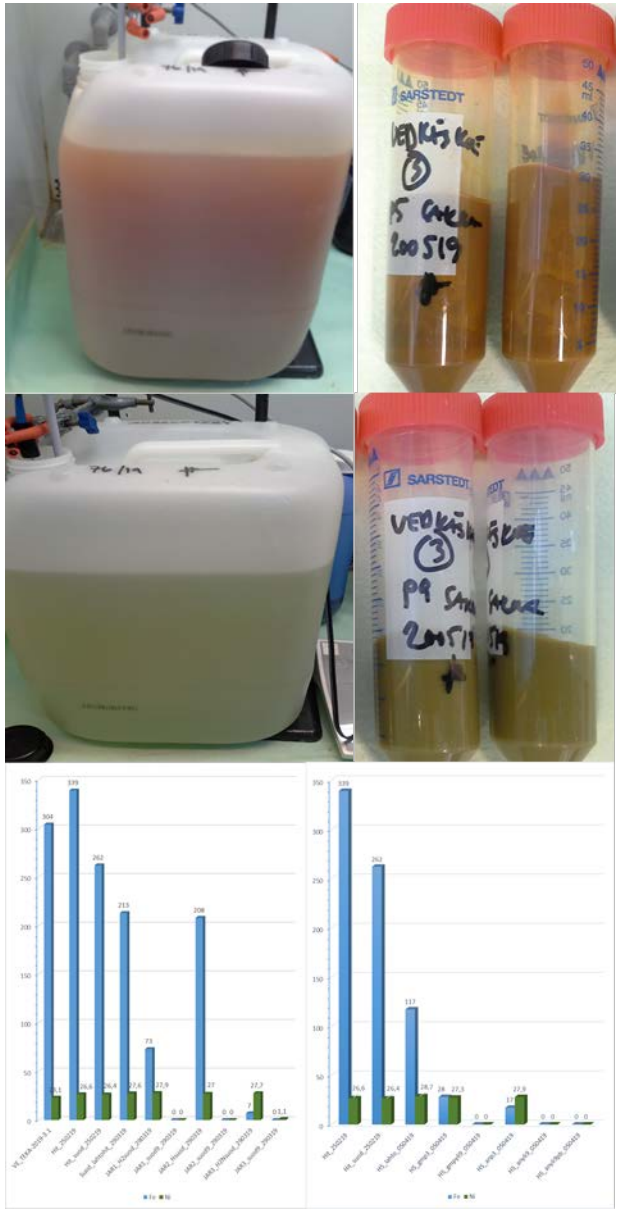
LABORATORY-SCALE TESTING

- The most interesting targets have been further studied at the UEF laboratory for recovery potential
- Studied targets at UEF include:
  - *Ni and Co recovery from Hitura drainage and water treatment sludge,*
  - *Nb and Ta recovery from the Keliber Li ore side stream*
  - *P and REE recovery from Siilinjärvi gypsum and drainage*
  - *REE-rich drainage samples from IPB in Spain*
- Based on lab-scale tests at UEF, larger scale piloting was designed together with Savonia and GTK



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UPDATE OF THE PILOT PLANT

- Designing larger scale field piloting based on UEF lab results and recommendations
- Piloting equipment installed in a 40'' sea container
- Updating includes obtaining water treatment equipment (oxidation-precipitation-sedimentation units), leaching units for solid materials, and general supplies for the piloting container (electricity, ventilation, etc.)

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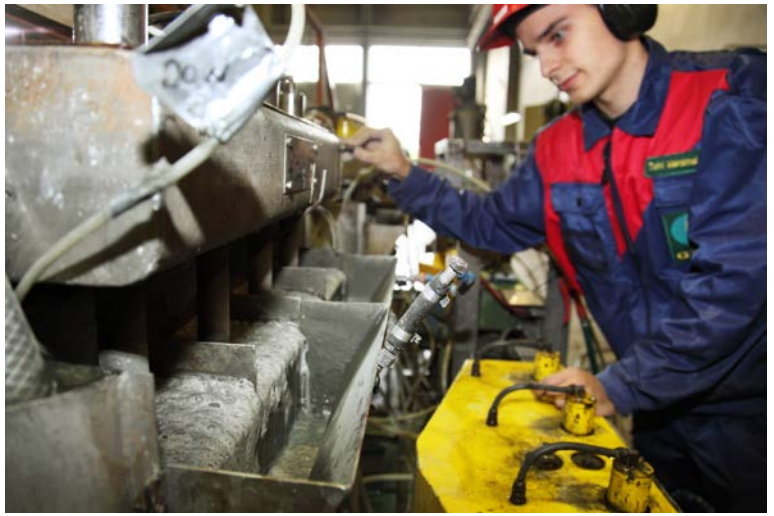
LARGER-SCALE PILOTING AT CASE SITES

- In 2020 pilot scale campaign will be run in Finland
  - *Hitura Ni-Co recovery based on water treatment system*
  - *Keliber ore Nb-Ta recovery based on leaching*
- In 2021 pilot scale campaign will be run in Spain
  - *REE recovery from drainage waters*



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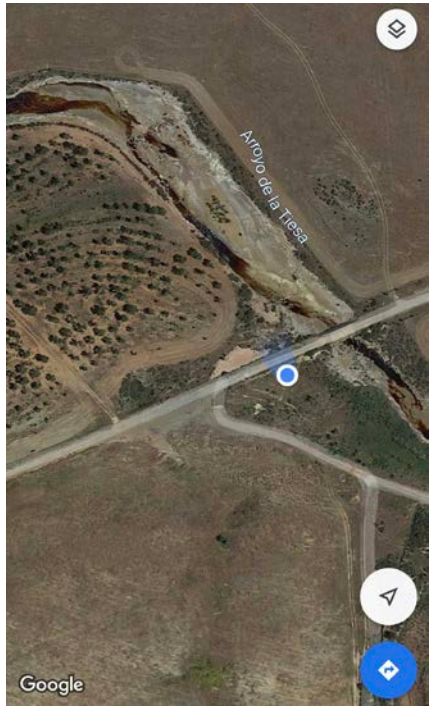
REE RECOVERY POTENTIAL AT THE IBERIAN PYRITE BELT, SPAIN

- Investigations on the SCYRE-rich acid mine drainages (AMD) in the Iberian Pyrite Belt (IPB)
- Potential target for recovery piloting: Tharsis mine site



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REE RECOVERY BY SELECTIVE METAL ACCUMULATION, SPAIN

- Investigating selective metal accumulation by passive AMD remediation system

GTK

THANK YOU

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www.gtk.fi

Project web pages: http://newprojects.gtk.fi/Morecovery/

https://www.researchgate.net/project/Morecovery-Modular-recovery-process-services-for-hydrometallurgy-and-water-treatment