

Aijala tailings area as an example of a source of secondary raw materials

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SMART GROUND PROJECT

The SMART GROUND project funded by the EU's Horizon 2020 program intends to improve availability and accessibility of information of the secondary raw material in the EU. The consortium will create a single EU database (SmartGround database) that integrates all the data from existing sources and new information retrieved with time progress. Such database will enable the exchange of contacts and information among the relevant stakeholders (e.g. companies), which are interested in providing or obtaining secondary raw materials. The project produces detailed information of secondary raw materials from three pilot landfills of each partner countries. Aijala tailings pond is one of the Finnish pilots.

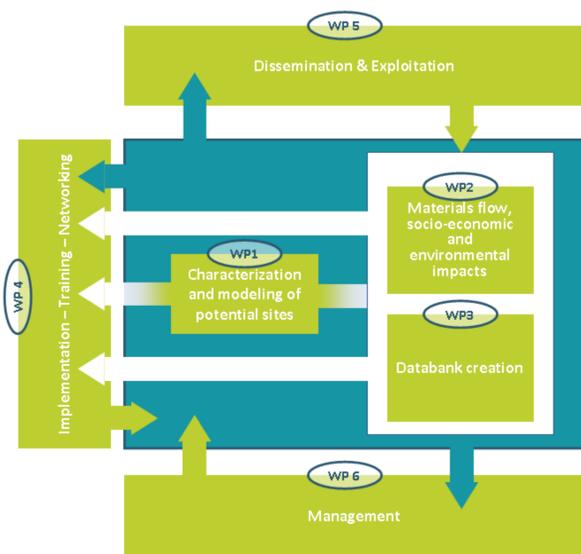


Figure 1. Workplan of the Smartground project. Data acquisition, geochemical assays and geophysical surveys are carried out in WP1, 3D-modeling of the Aijala tailings pond in WP2 and database construction in WP3

AIJALA TAILINGS POND

The Aijala tailing pond consists of two layers: lead rich tailings from Metsämonttu mine and copper rich tailings from Aijala mine. The layers can be distinguished from the geochemical data. Thickness of the tailings pond and bedrock depth were interpreted from gravimetric surveys with bottom of the drill holes as reference points. The final modeling is still in process and it will furthermore be improved by results of electrical resistivity tomography.

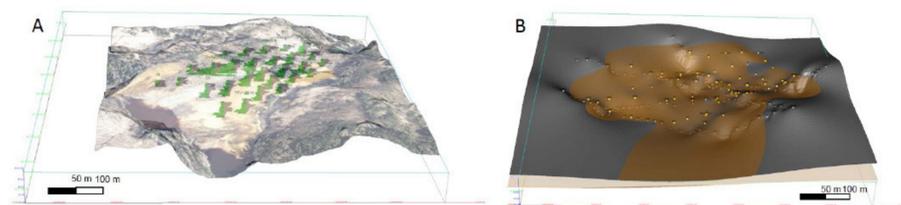


Figure 2. A) LiDAR topography with an aerial photograph of the Aijala tailings pond and the drill holes with copper (green) and lead (grey) contents. B) Bedrock as grey surface and bottom of the tailings as brown surface.

MINERAL RESOURCE ESTIMATION

Blocks belonging to Metsämonttu or Aijala mine tailings layers were distinguished with the topography, bedrock, tailings pond bottom surfaces and the interface between the Metsämonttu and Aijala tailings layers. The latter was interpreted from the geochemical change in the drill cores.

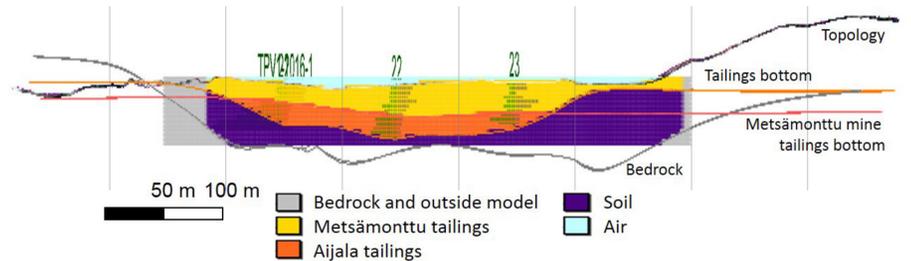


Figure 3. Blocks belonging to the Metsämonttu and Aijala mine tailings layers were divided using surfaces describing topography, tailings bottom, Metsämonttu mine tailings bottom and bedrock.

INTERPOLATION

Kriging method with horizontal search radius of 200 m in length and width and 2 m in depth was used to interpolate the metal contents in the block model. Copper content is shown as an example.

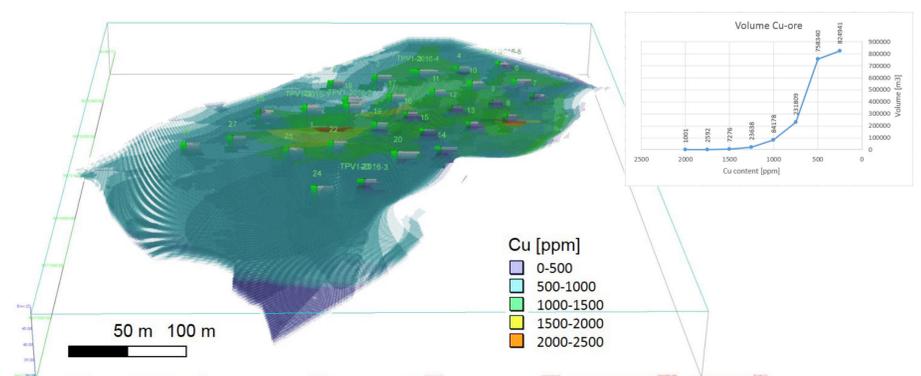


Figure 4. Block model showing the interpolated copper content in Metsämonttu mine tailings layer.

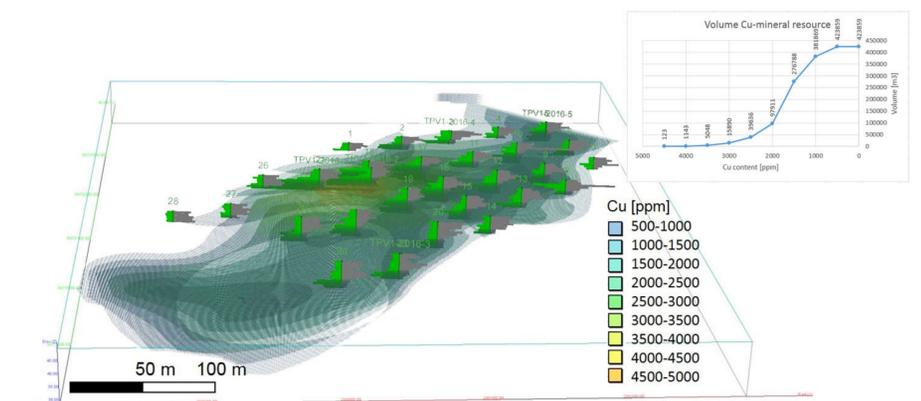


Figure 5. Block model showing the interpolated copper content in Aijala mine tailings layer.

CONCLUSIONS

The Aijala tailings pond pilot presents an example of a secondary raw material source in EU. The structure of the tailings pond was modelled in 3D. The information concerning the landfill can be found later in the standardised EU landfill databank, and it can be utilised by the possible re-user of the raw material to make feasibility study and planning the operations.

References

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