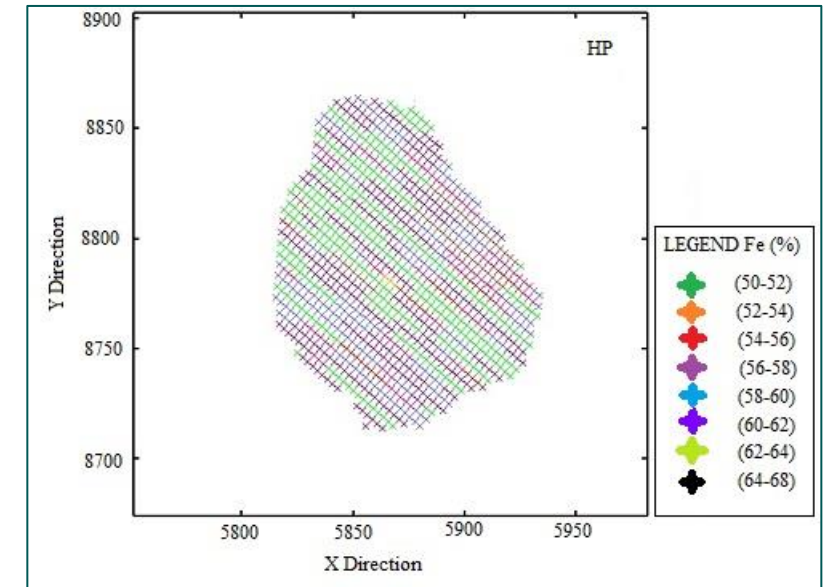
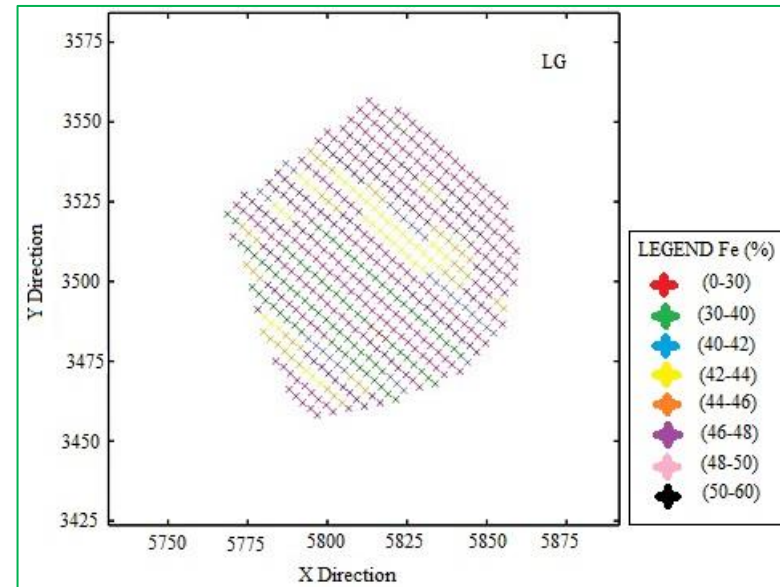
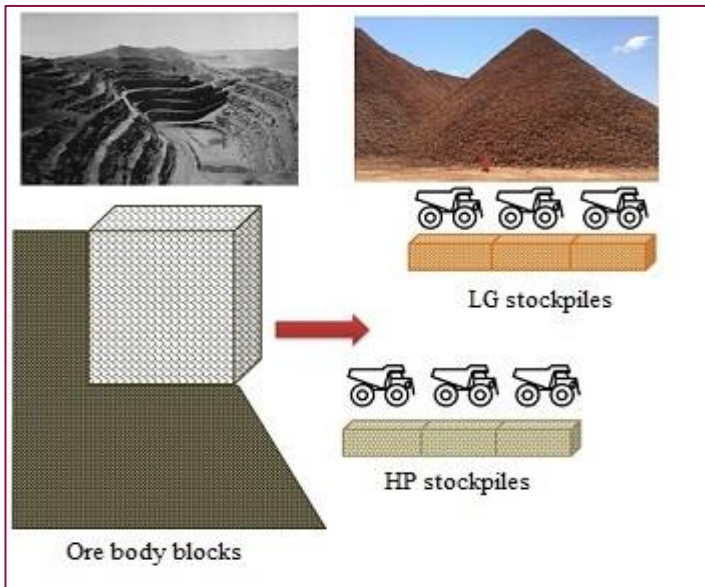


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Feasibility assessment of recovering raw materials from stockpiles and tailings (Industrials and mining) (*INTERNATIONALIZATION Program*)

- **Metal and critical raw materials recovery from stockpiles and tailings:**
Spatial characterization of the selected stockpiles **based on history data of mining operations and truck shovel flows**, and so **before new sampling phase**; modelling of the spatial grade of valuable materials inside the stockpile and design of the optimum number of sampling.
- **Expected synergies and complementarities:**
Synergies between the research unit of University of Bologna, with expertise in mining operations and statistical/geostatistical data analysis and interpretation, software companies providing services for design of mining processes and mining companies providing the stockpile case studies in project partner countries with potential availability of critical raw materials.
- **Outcomes:**
Assessment of the possible recovery of raw materials from stockpiles and tailings applying advanced resource assessment methods, **before the new sampling phase**. A framework and its tool validated on different mining/stockpiles case studies and implemented in commercial software.
- **Market & Business opportunities:**
Available stockpiles and tailings from tunnelling activities, mining and processing plants spreading in all around the world; advances in assessment of raw materials (in particular strategic metals); reconsideration of stock materials as a new source; reuse and modification of the closed processing plants according to the new feeds from estimated stockpiles properties; removal of tailings and stockpiles as environmental hazards.
- **Partners already identified:**
University of Brasilia (Brazil), University of Yazd (Iran), University of Cairo (Egypt), University of Zagreb (KIC Partner), Geovariances (French software house, specialised in developing geostatistical tools for mineral resource assessment).
- **Wanted additional partners:**
Industrial partners involved in the management of the stockpiles and tailings in the three extra-EU countries identified (Brazil, Iran, Egypt) and in South East Europe.

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Simplified flowchart of piling modelling from ore deposit

Map of *Fe* variability (%) in high phosphorous (*HP*) and low grade (*LG*) stockpiles obtained by simulation of piling procedure