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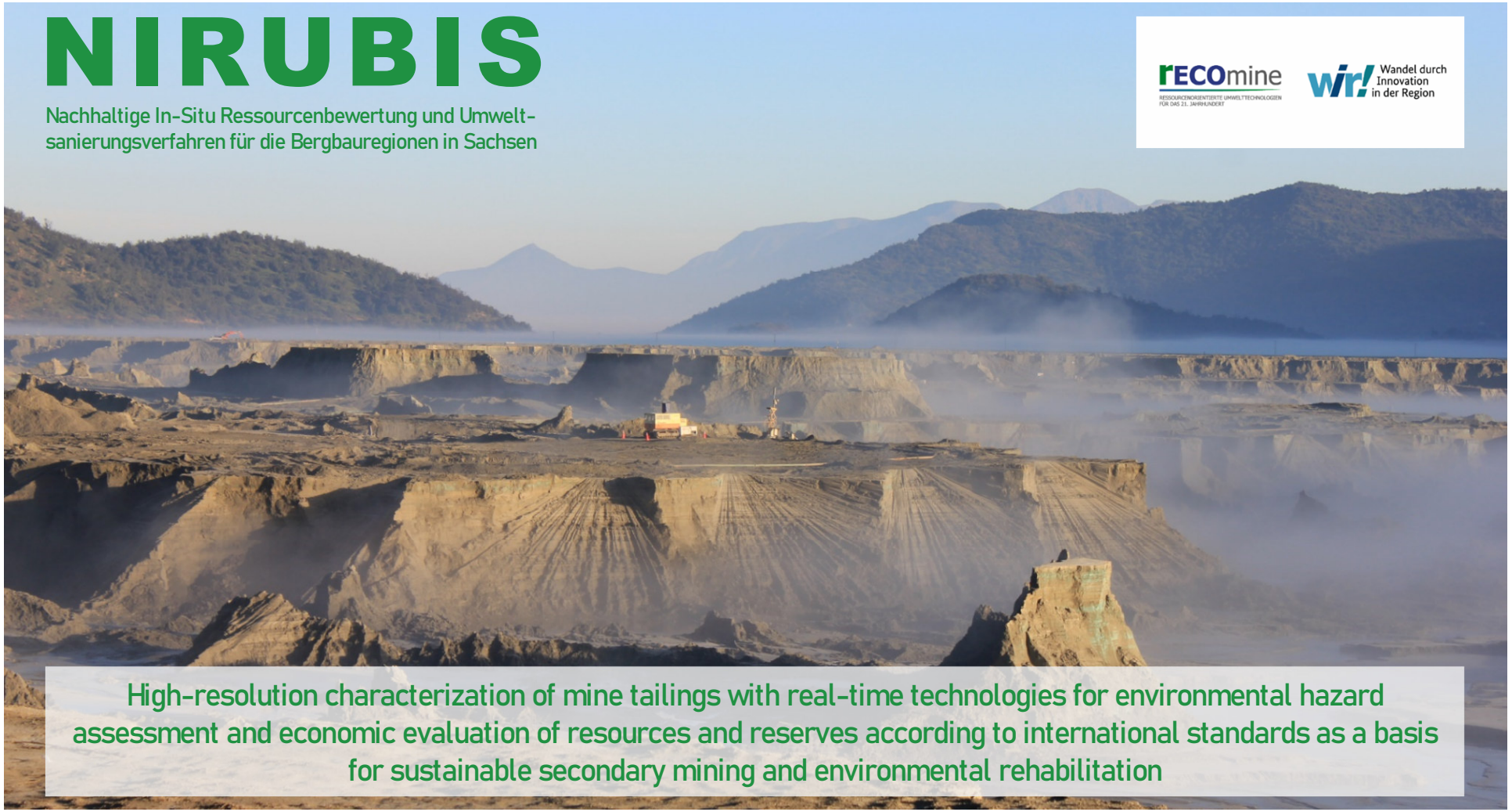
Nachhaltige In-Situ Ressourcenbewertung und Umweltsanierungsverfahren für die Bergbauregionen in Sachsen



High-resolution characterization of mine tailings with real-time technologies for environmental hazard assessment and economic evaluation of resources and reserves according to international standards as a basis for sustainable secondary mining and environmental rehabilitation

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Consortium and site Ehrenfriedersdorf

PERC PAN-EUROPEAN RESERVES + RESOURCES REPORTING COMMITTEE
RC asbl no. 0.521-825-257 registered Bruxelles 7 March 2013

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PERC REPORTING STANDARD 2017

PAN-EUROPEAN STANDARD FOR REPORTING OF EXPLORATION RESULTS, MINERAL RESOURCES AND RESERVES ("THE PERC REPORTING STANDARD")

The Pan-European Reserves and Resources Reporting Committee (PERC asbl) approved and published 16th June 2017

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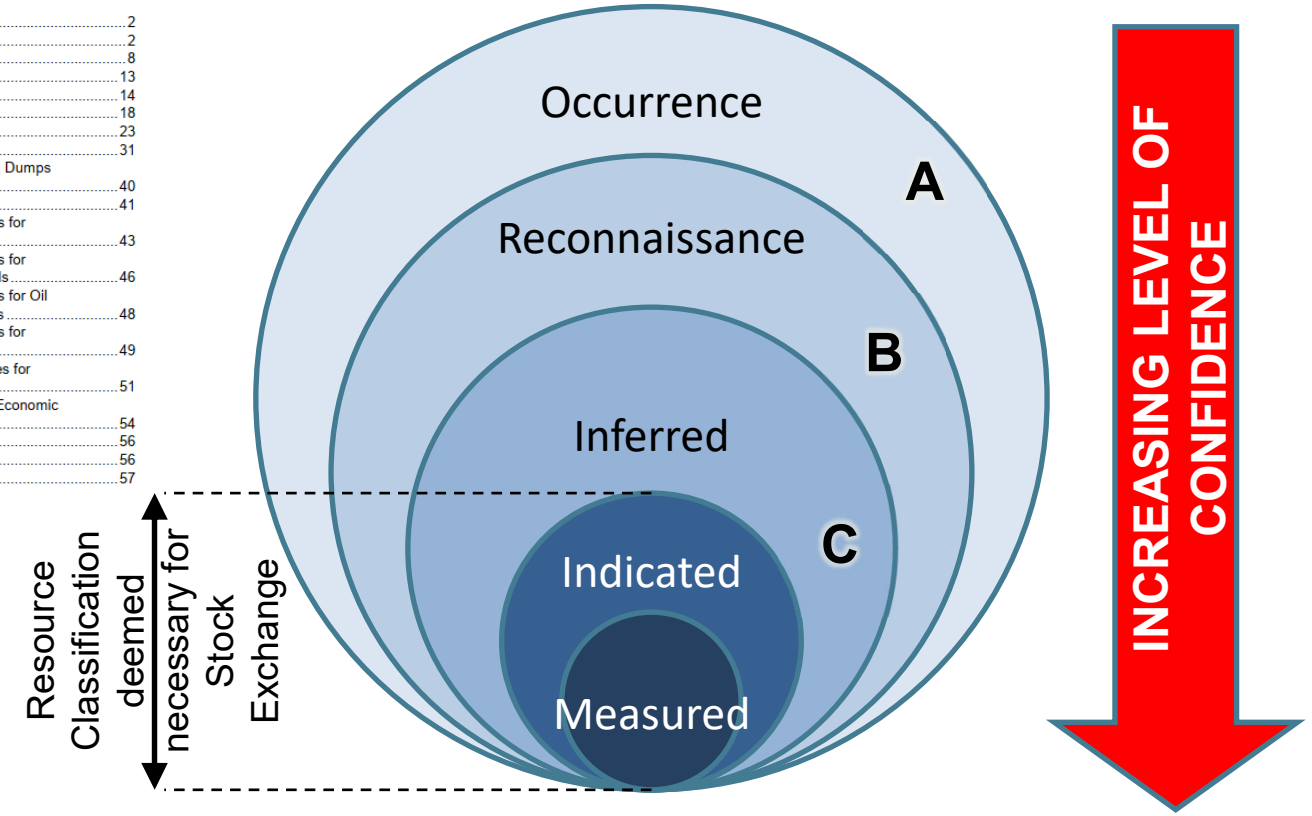

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Objective and approach

The project objective is to apply a new approach to **resource estimation** for tailings.

The objective is to provide reliable quantitative data on the content of **valuable elements and pollutants** in tailings ponds for **feasibility studies.**

- First step in the **value chain** as a basis for further services of the **rECOmine network**

High-resolution **characterisation** of the tailings with cost-effective probing technology.

- **Digital data acquisition** in real time (metals, elements, geotechnics, hydraulic permeability)

Development of a **model** of the tailings to map the chemical and mineral distribution patterns.

- **Internal geometry**, contaminant distribution, hydraulics, soil classes, stratification

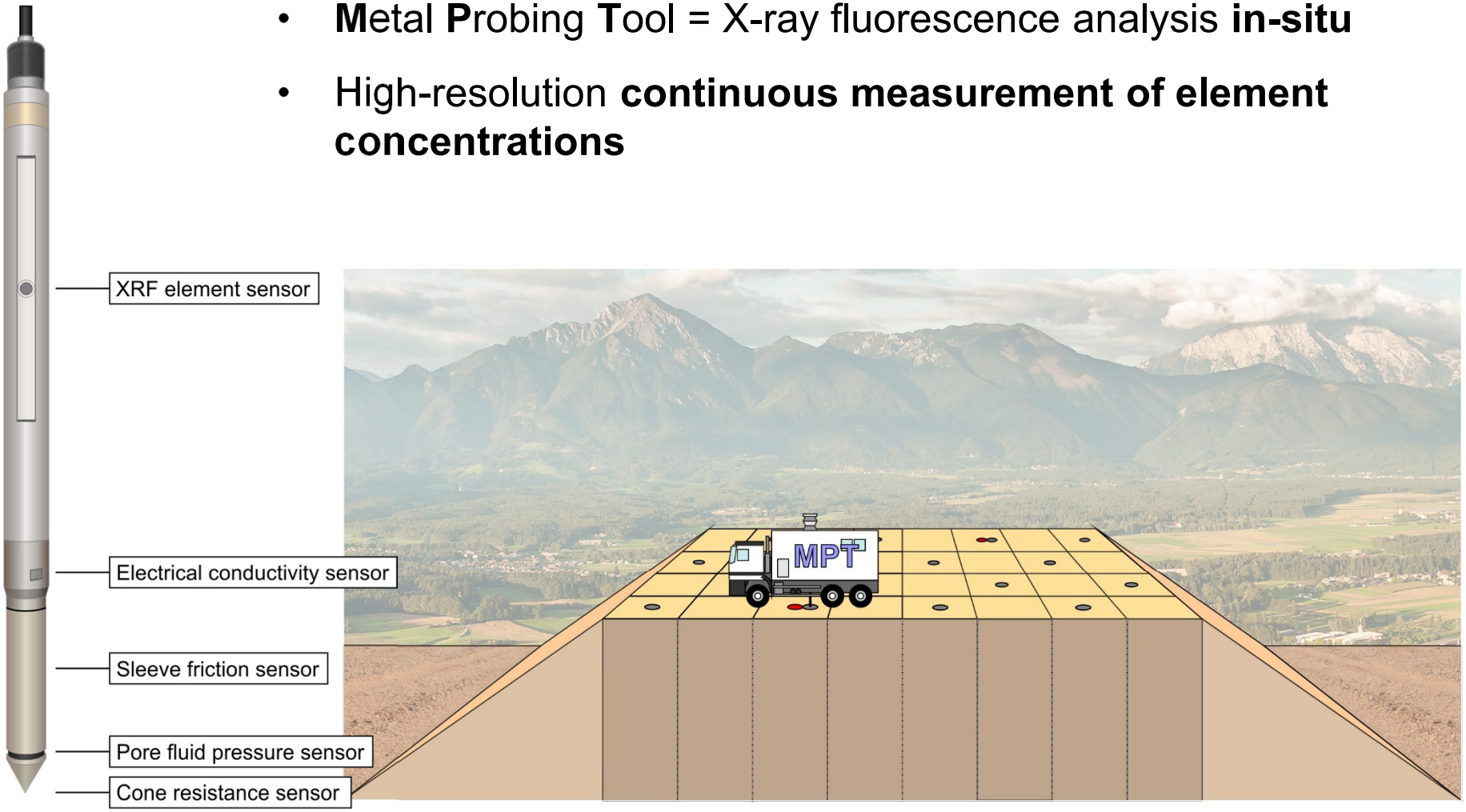
Economic evaluation of **resources and reserves** according to International Standard (**PERC**)

- Application of the code to sedimentary bodies, variography, interpolation, block model.
- Resource statement with safety probability according to PERC

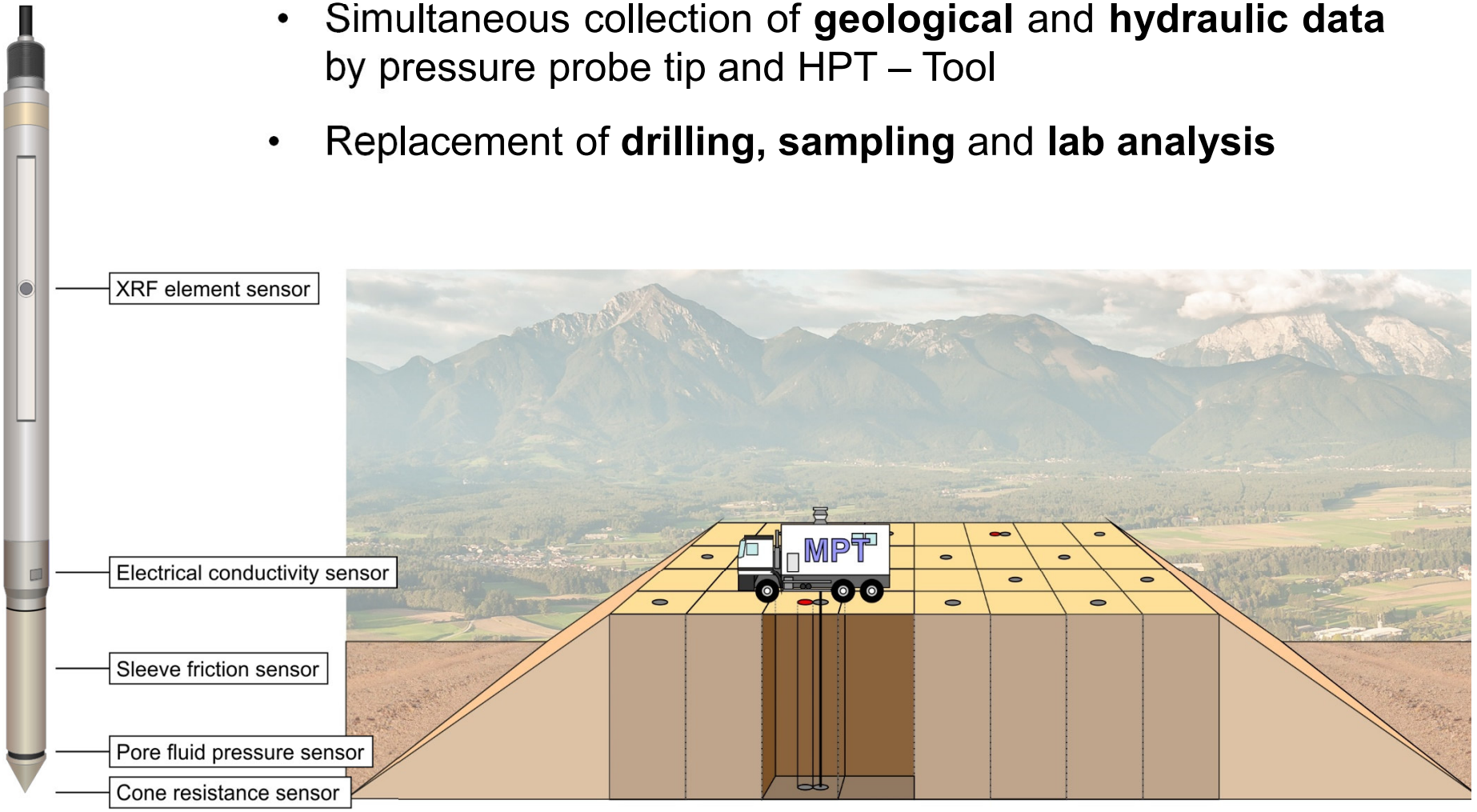
Input - parameters for **environmental remediation** and **secondary mining** by in-situ processes.

- In-Situ Cementation = Sealing
- In-Situ Leaching
- Hydraulic systems

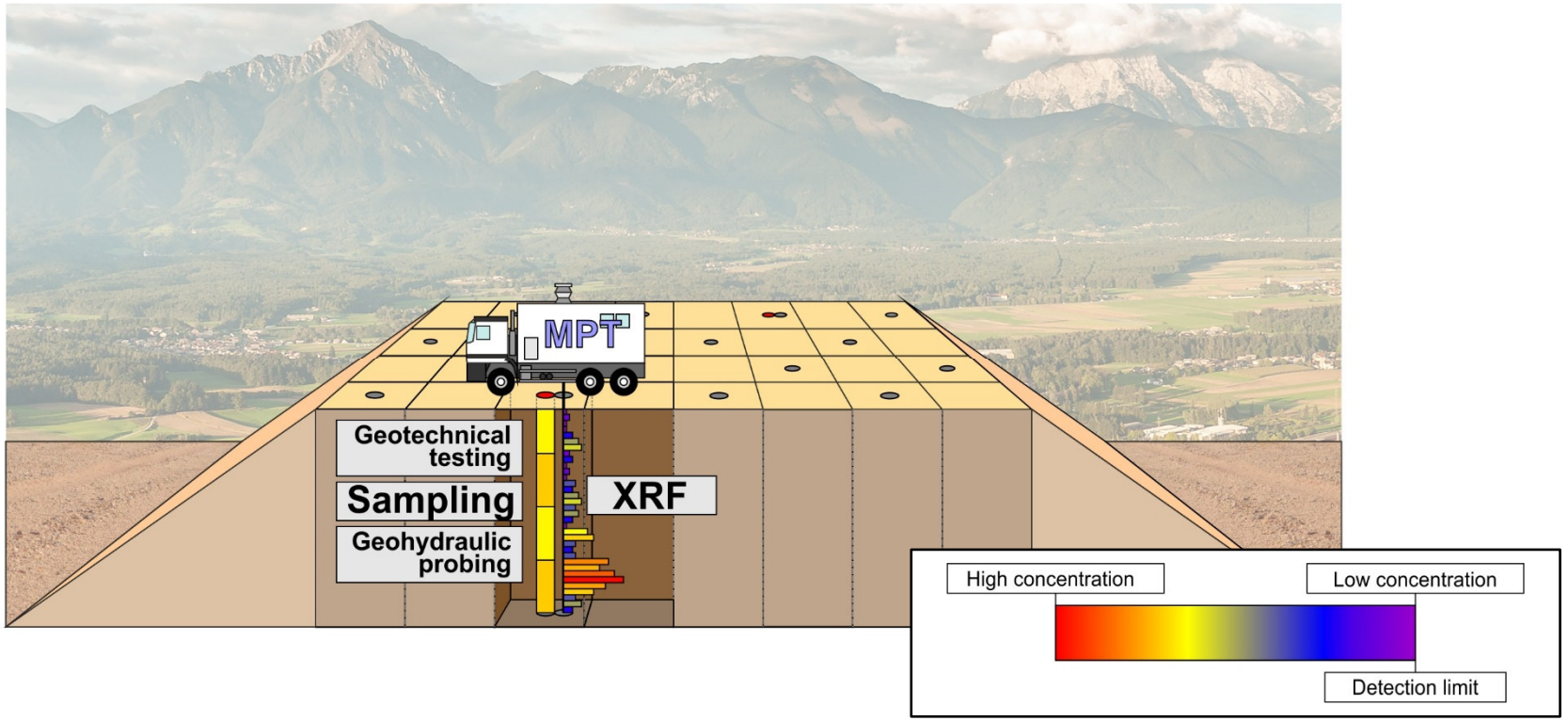
- **M**etal **P**robing **T**ool = X-ray fluorescence analysis **in-situ**
- High-resolution **continuous measurement of element concentrations**



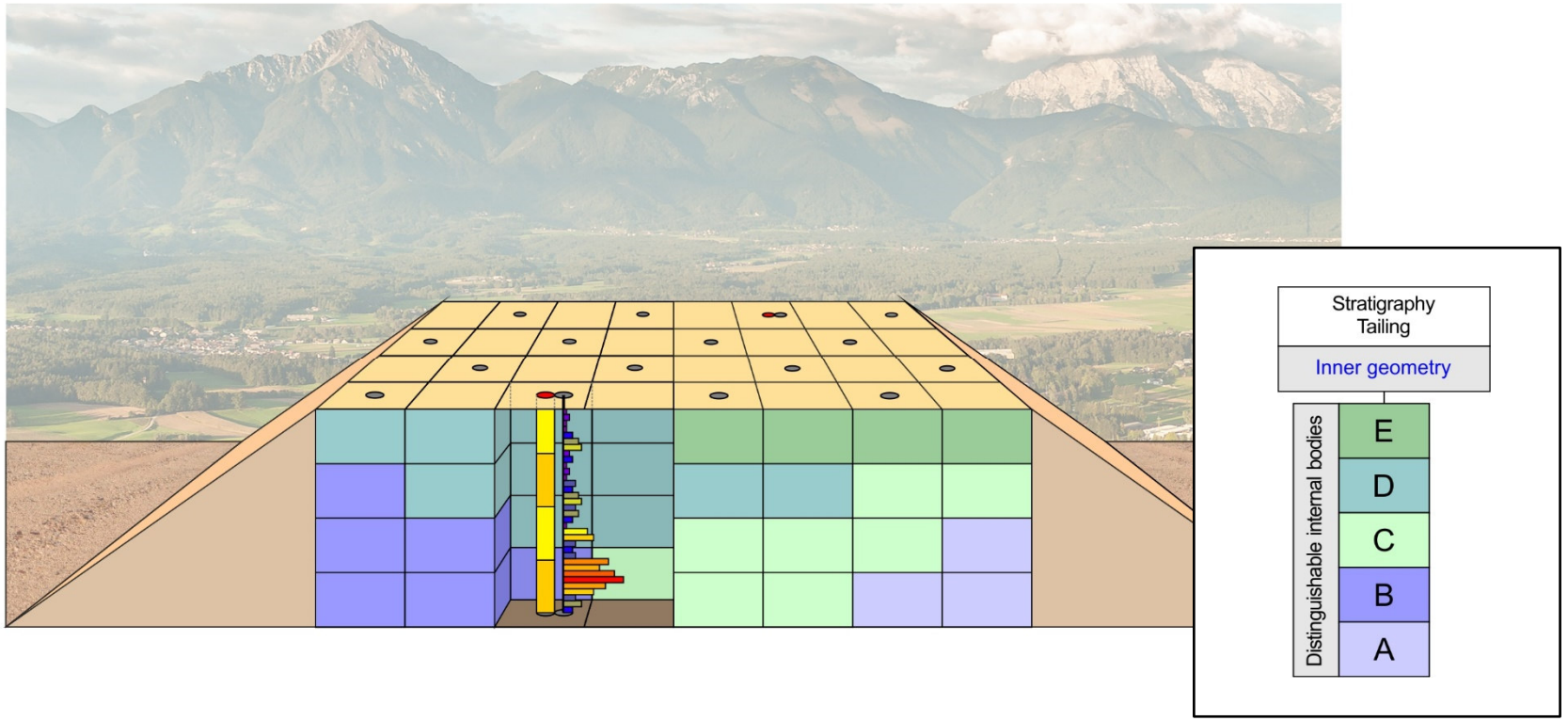
- Simultaneous collection of **geological** and **hydraulic data** by pressure probe tip and HPT – Tool
- Replacement of **drilling, sampling** and **lab analysis**



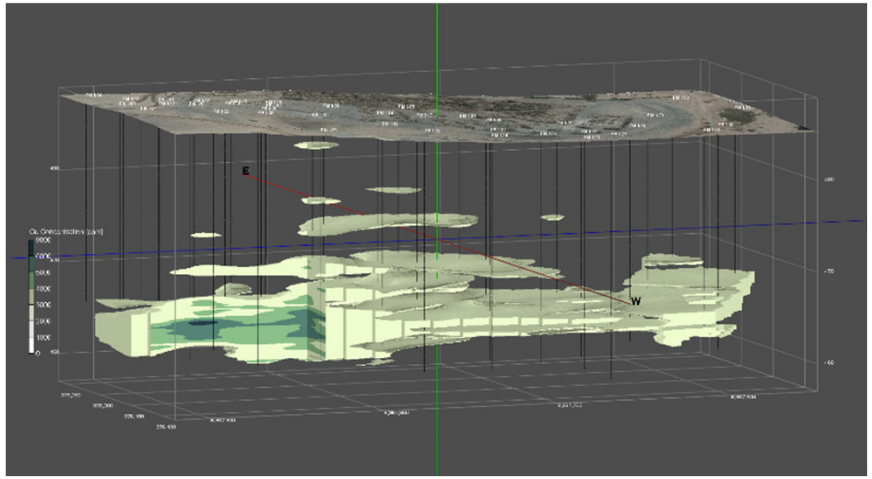
- Selected sampling by **Direct – Push technology**
- **Calibration** of in situ measurement data
- **Mineralogical analysis** and classification

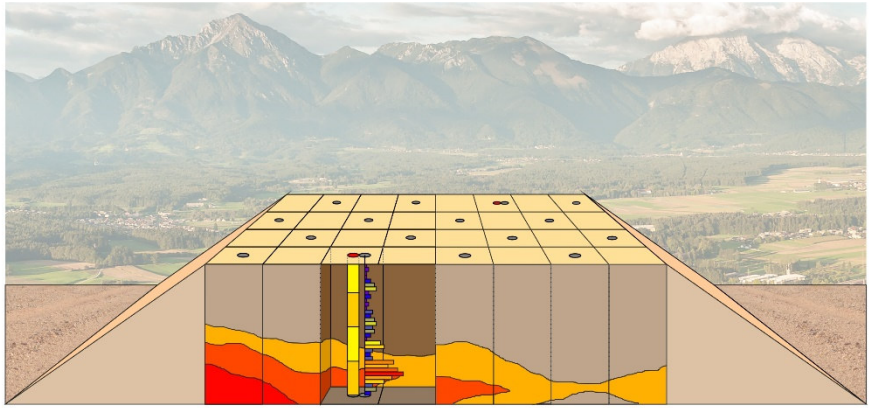


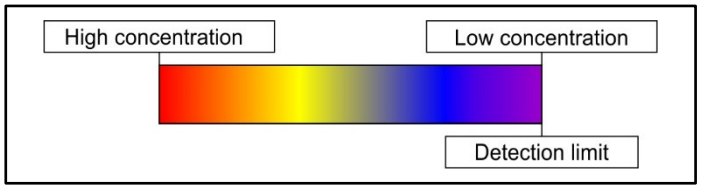
- Derivation of the internal geometry on the basis of **soil classes**
- **Interpretation** of sedimentologically defined **tailing sub-bodies**
- Mapping of **mineralogical distribution patterns**



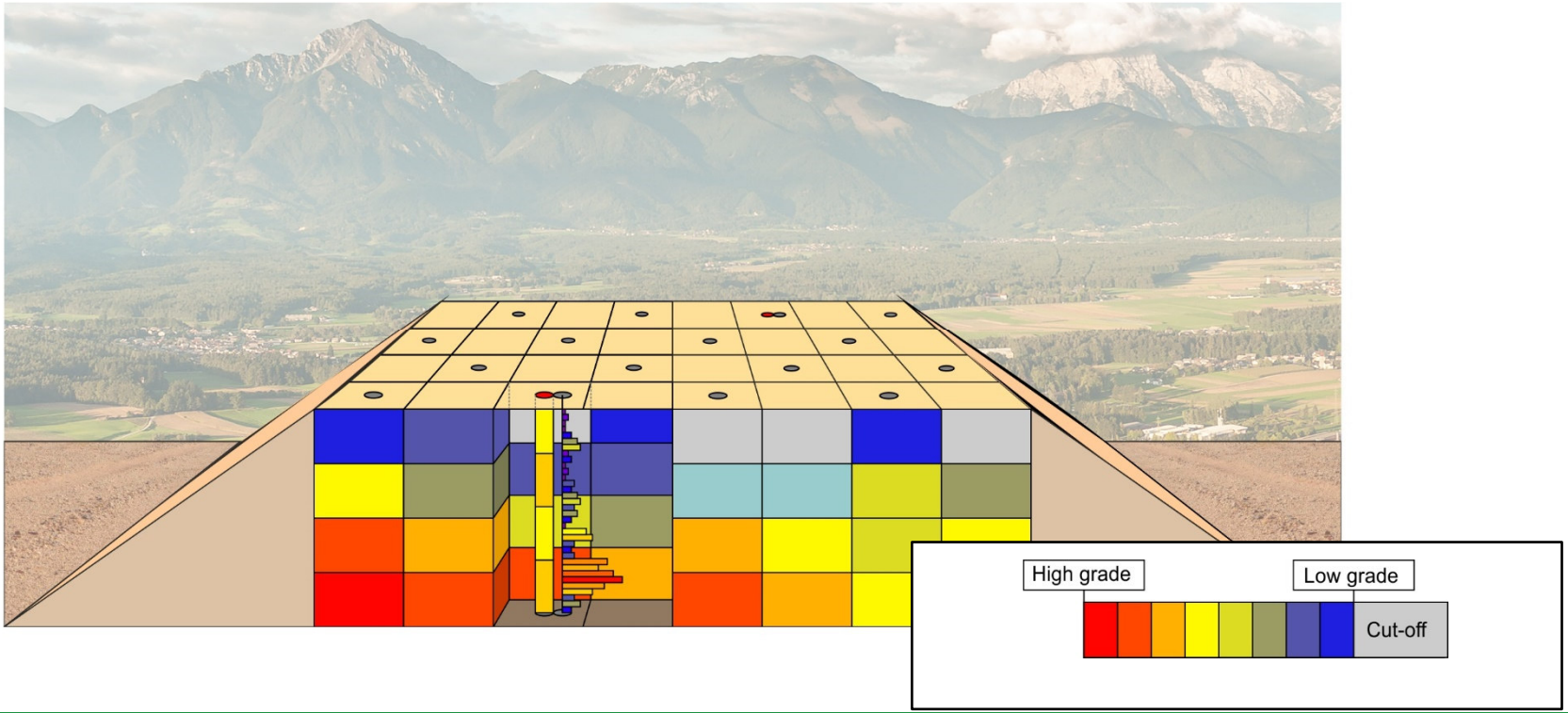
- **Multivariate statistics** to determine element factors
- Interpolation of identified sub-bodies by means of **geostatistics / variography**
- **3D - modeling** of the inner geometry and the concentrations of **valuable substances / pollutants**







- **Block model** on the basis of the **3D pollutant / valuable material identification**
- **Exploration report** with statement of the **probability** & **cut-off** for elements and combinations
- **Resource Statement** according to **PERC**



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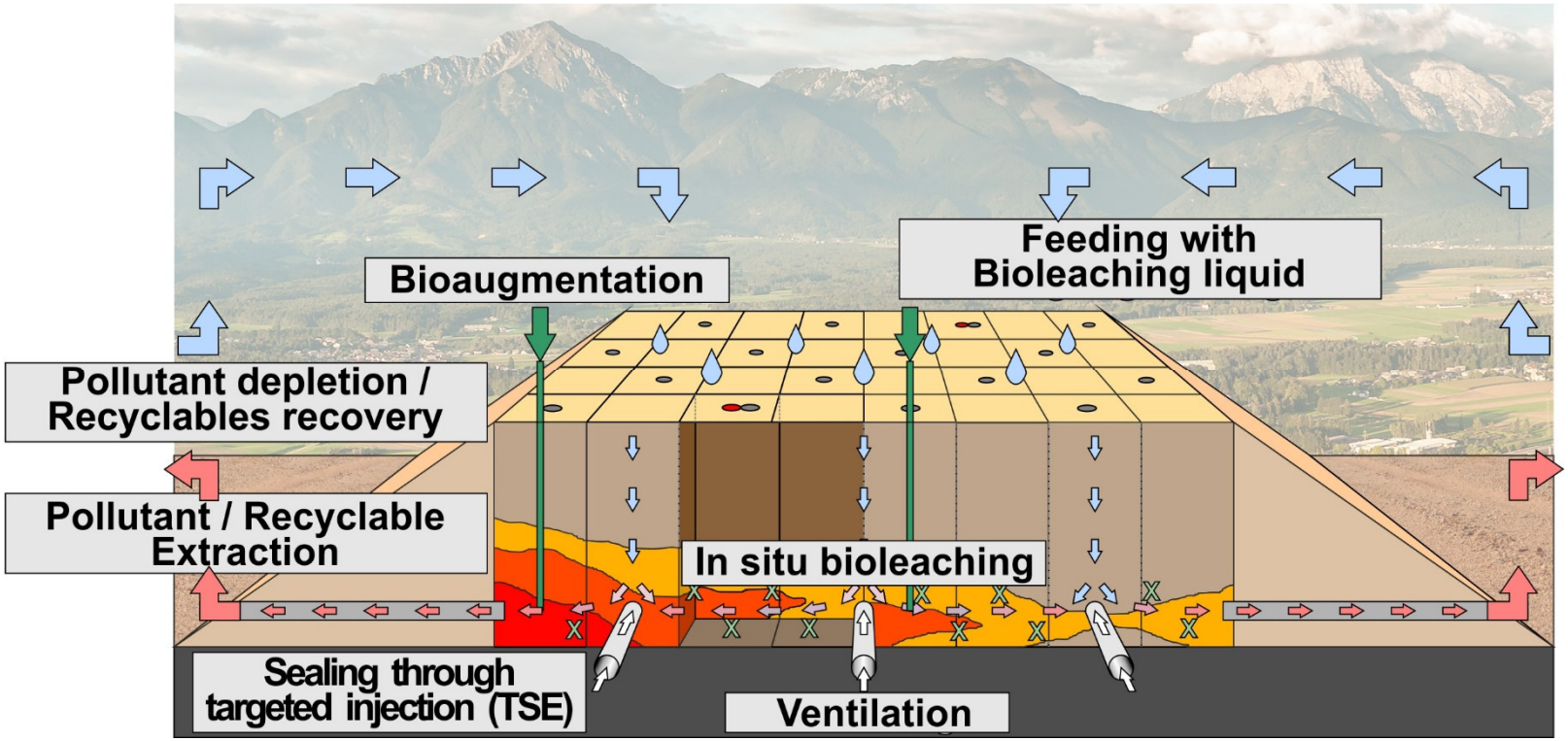
Perspective: In-situ remediation / mining



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Lead institution

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