



ESCORSA

GEOLOGICAL CONSULTANCY AND LABORATORY

NOVEMBER 2014





The **escOrsa** team consists of professionals with extensive experience in mining and engineering geology, who have conducted numerous successful projects for governmental and private companies with expertise in different sectors:

- Geotechnical and Civil engineering
- Mining exploration
- Environmental projects

Technical team

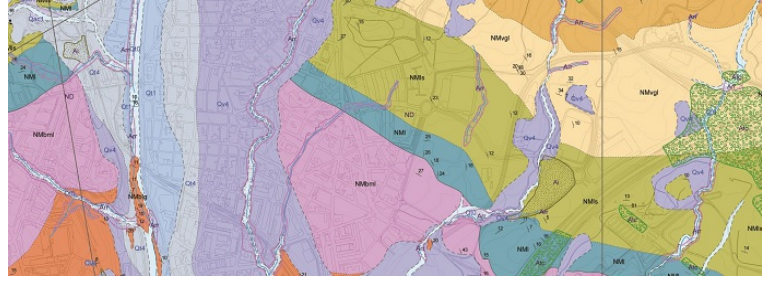
With a solid academic basis, extensive experience and high levels of motivation, the technical team is **escOrsa's** main asset. The team consists of **graduates and PhDs in geology**, engineering geology and environmental science with more than 15 years of experience:

- **escOrsa** participates in research projects with several universities and public organizations.
- Associated professor at the Department of Geotechnical Engineering and Geo-Sciences, technical University of Catalonia.
- Collaboration agreement with the Faculty of Geology, University of Barcelona.
- Member of the Applied Mineralogy and Environment Research Group, recognized research group by the Ministry of Science and Technology (Government of Spain).
- Fellowship of the Spanish Mineralogical Association and the European Federation of Geologists.
- Support of specialists from the Geological Institute of Catalonia.

International Experience and Remarkable clients

Our international experience consist in several projects in different countries as Spain, France, Denmark, Norway, Chile, Peru, Bolivia, East Timor, Algeria and Qatar among others.

In those projects we have worked and collaborated with public institutions and private companies such as the University of Barcelona, Technical University of Catalonia, Autoridad Bi-Nacional Autónoma del Lago Titicaca, Geotechnical Danish Institute, Volcanic Basin Petroleum Research, Amphos 21 consulting, Cartographical and Geological Survey of Catalonia, Natural History Museum of Barcelona, Amphos21 Consulting SAC Perú, Bear Creek Mining Co. Boston Minerías, SL, Compañía minera Santa Luisa, Ariana Operaciones Mineras SAC, Burgeap France, Hatch Asociados SA...



FIELD DATA COLLECTION AND GEOLOGICAL INTERPRETATION

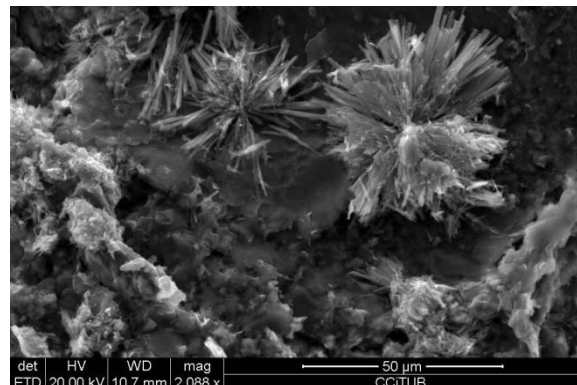
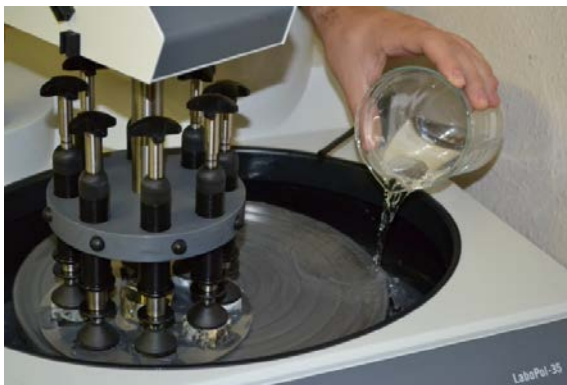
- Field geological characterization and data collection:
 - Outcrop study and characterization
 - Specialized sampling of soils and rocks
 - In situ tests
- Drilling Management, sampling and interpreting borehole columns (mining, geotechnical, stratigraphic...)
- Assessment of natural Gamma radiation emitted by rocks and geological materials
- Geological mapping and cartographic works



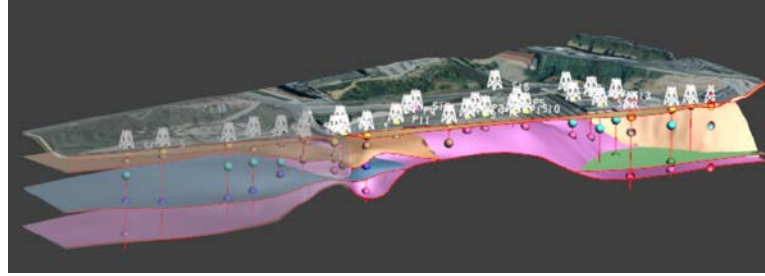


GEOLOGICAL LABORATORY

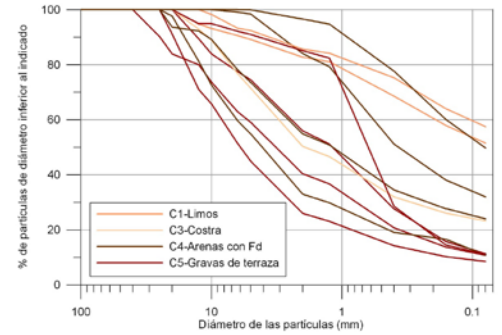
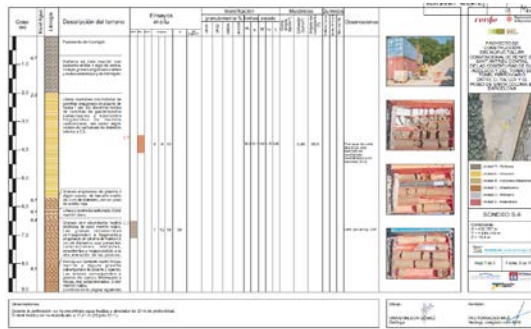
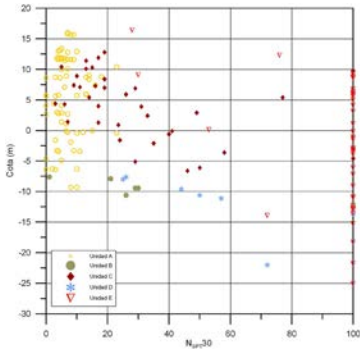
- **Geotechnical and Soil Mechanics Laboratory**
 - Identification and natural properties of soils
 - Strength and stiffness of soils
 - Deformability, consolidation and swelling of soils
 - Permeability
 - Compaction tests and related road tests
 - Chemical analysis of soil and water
- **Rocks Laboratory**
 - Assessment of the compressive strength, elastic modulus and tensile strength of rocks
 - Assessment of rock abrasiveness and hardness
 - Special tests for tunnelling and underground excavation
- **Mineralogical and petrographic laboratory**
 - In-house preparation of petrographic thin sections and metallographic mounts.
 - Mineralogical analysis with transmitted and reflected polarized light microscopy.
 - Analysis of minerals and rocks using X-Ray Diffraction (random powder, oriented aggregate mounts for clay analysis, quantification with Rietveld's method).
 - Petrographic and mineralogical analysis with Electron Microscopy with Energy Analyzer (SEM-EDS).
 - Mineralogical analysis with Electron Microprobe.
 - Geochemical analysis by inductively coupled plasma mass spectrometry (MS ICP-OES)
- **Collaboration agreement** with the Faculty of Geology and the Scientific and Technological Centers of the University of Barcelona.



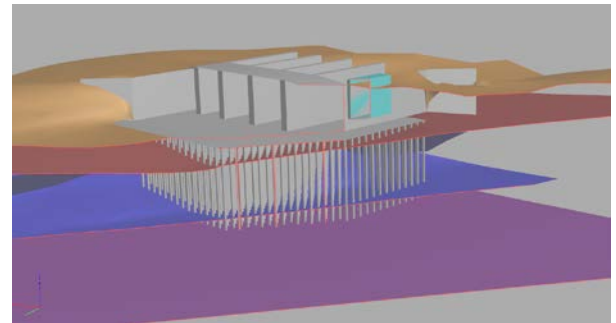
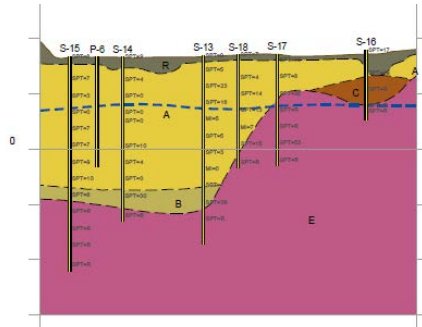
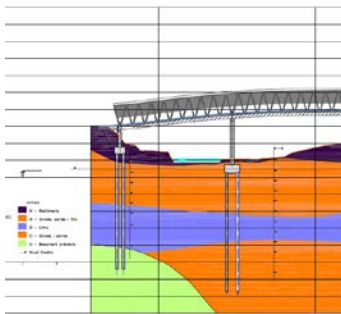
GEOTECHNICAL CONSULTANTS



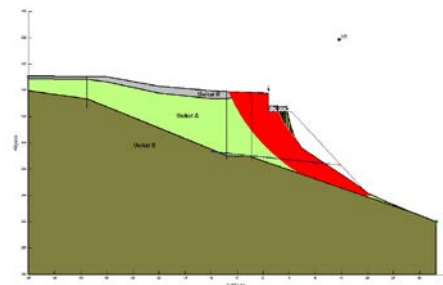
- **Geotechnical characterization**
 - Complete integration of field and lab data



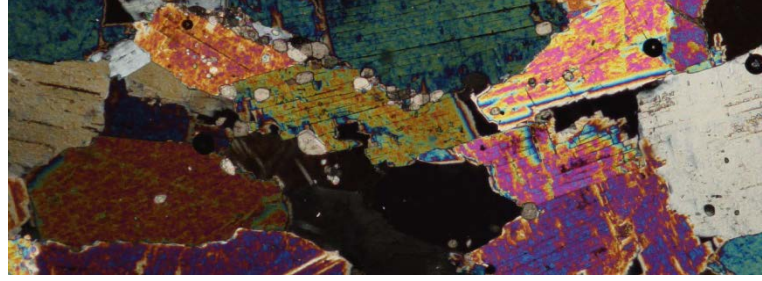
- **Foundations and soil-structure interaction**
 - Comprehension and adaption to your project
 - Best choosing of alternatives



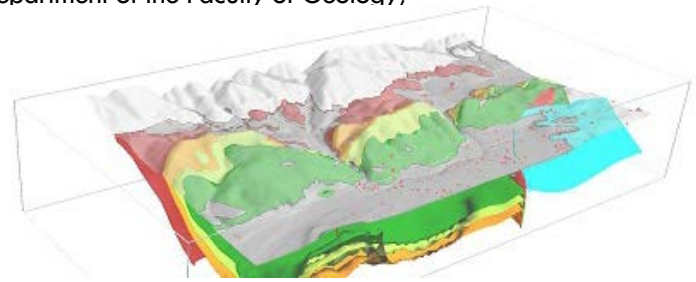
- **Geotechnical investigation for:**
 - Civil engineering projects
 - Building and construction projects
- **Slope stability and Natural Hazards**
- **Landfill and terrain compaction**
- **Ground water interaction**
- **Hidrogeology**



MINERALOGICAL AND PETROLOGICAL CONSULTANTS

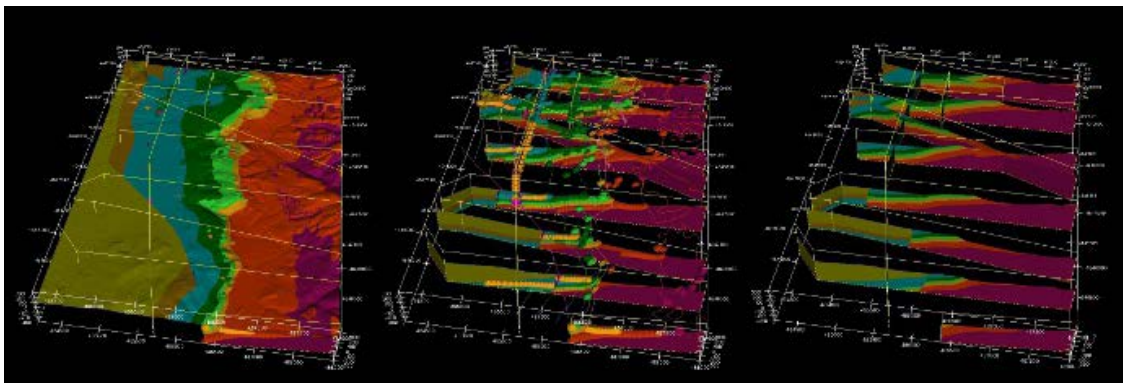


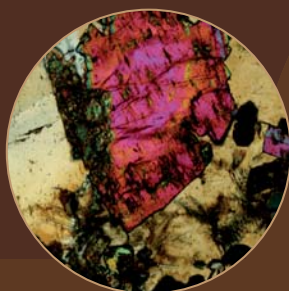
- Petrographic assessment and mineralogical analysis with transmitted and reflected polarized light microscopy.
- Quantification of mineral phases: modal counting and morphometric analysis
 - Automated stage to perform counts on thin sections and metallographic mounts.
 - Morphometry software and imaging for microscopy, digital processing of images, and measures of grain size, areas, proportions, distances...
- Analysis of minerals and crystalline phases using X-ray Diffraction
 - Whole rock analysis (random powder method)
 - Clay analysis (oriented aggregate mounts)
 - Quantitative mineral phase analysis: Rietveld method
- Textural study of rocks with Electron Microscopy with Energy Analyzer (SEM-EDS)
- Complete geochemical assessment by inductively coupled plasma mass spectrometry (MS ICP-OES)
- Collaboration agreement with the Mineralogy Department of the Faculty of Geology, University of Barcelona.



GEOLOGICAL CONSULTANTS

- Geological database designs to optimize the working processes of projects or organizations, organizing field, lab and/or bibliographic data, using geological criteria.
- Data homogenization. **escOrsa** has extensive experience in critically homogenizing a wide variety of geological information, whether dispersed or underutilized
- Interpretation, comprehension and representation of geological data
 - Geological and thematic mapping
 - 3D geometric modeling
 - Specific models designs





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