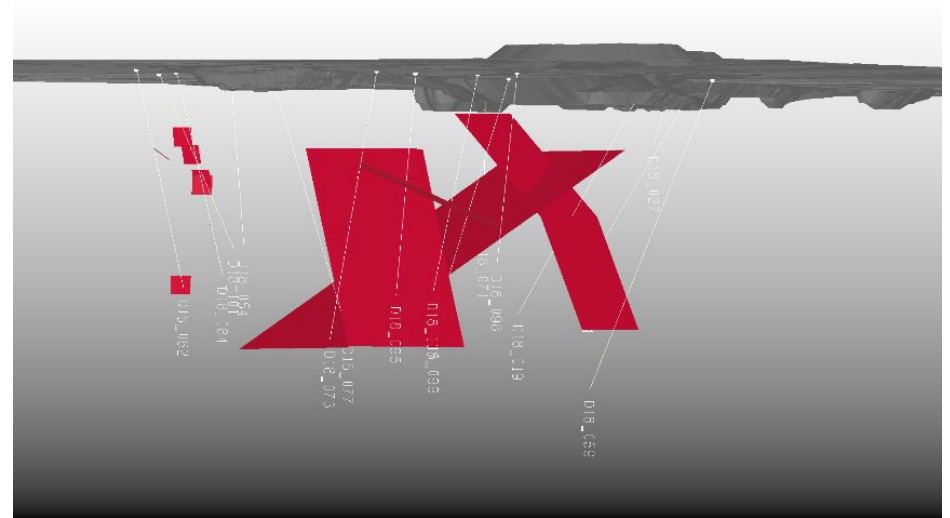
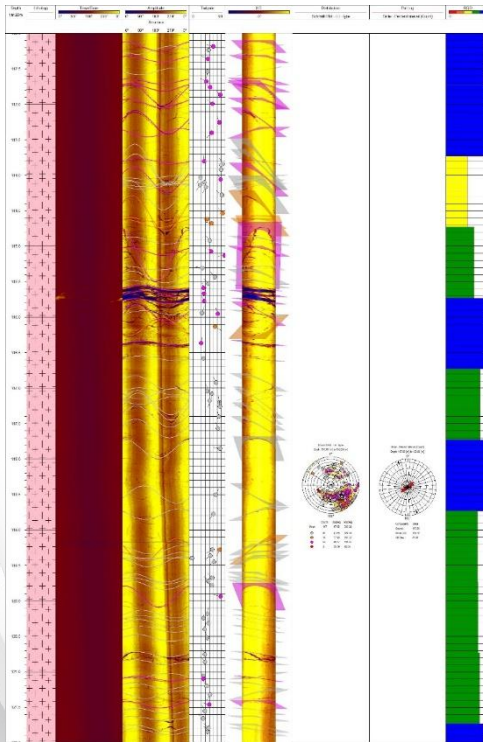


Detailed exploration of an ore deposit in Kazakhstan with an innovative combination of geotechnical and borehole geophysical measurement methods and structural 3D modeling

Dr. Godrat Rafat (Assoc. Prof.), Prof. Vladimir Mansurov, Ivo Kerošević M. Sc., Dipl. Geol. Ming Han Tse



Borehole geophysics

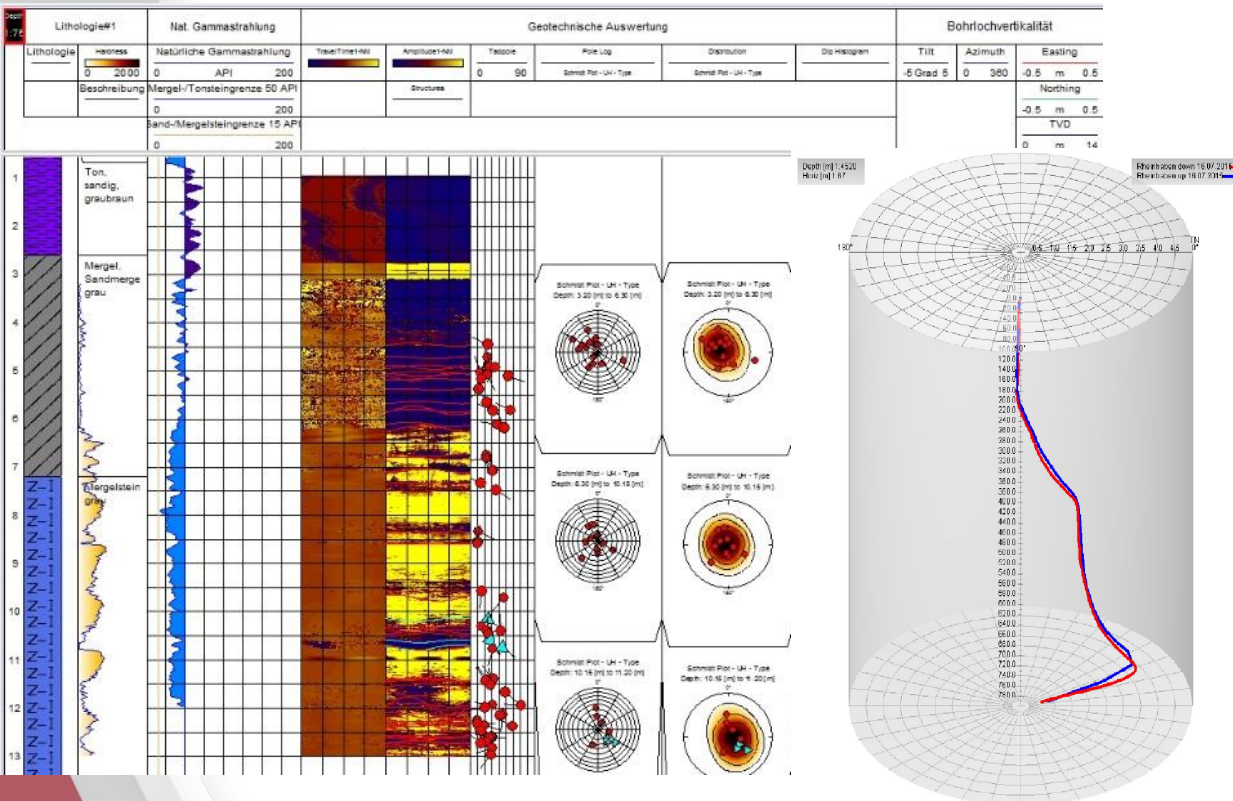
- Wire line
- Exploration
- Geotechnical investigations
- Hydrogeology
- Mining
- Inspection of old mining
- Inspection of radioactive waste repositories



Geotechnical Investigations

- Caliper Log (3 arm, 4 arm, 3D acoustic)
- **Natural Gamma-Ray Logging (GR)**
- Spectral Gamma-Ray Logging (GR.S)
- Pulsed Neutron-Neutron (INN)
- Density Log (GG.D)
- Full Wave Sonic Log (FWS)
- **Conventional and Focused Resistivity Log (FEL, DLL)**
- Self Potential (SP)
- Induction Log (DIL)
- **Acoustic Borehole Scanner (ABI 40, FAC)**
- **Optic Borehole Scanner (OBI, OPTV)**
- Magnetic Suszeptibility (Mag Sus)
- **Deviation of Boreholes (Magnetic or Gyro Sensors)**
- **2D, 3D RADAR and RADAR Tomography**

Geotechnical Investigations



- Borehole deviation
- Dip and dip direction of bedding, joints, fault zones and outbursts
- Assignment of joint structures
- Lithological assignment
- Mechanical parameters of rocks
- Field stress orientation
- Rock mass rating
- Redevelopment of old mining fields
- Repository exploration

Work Stages

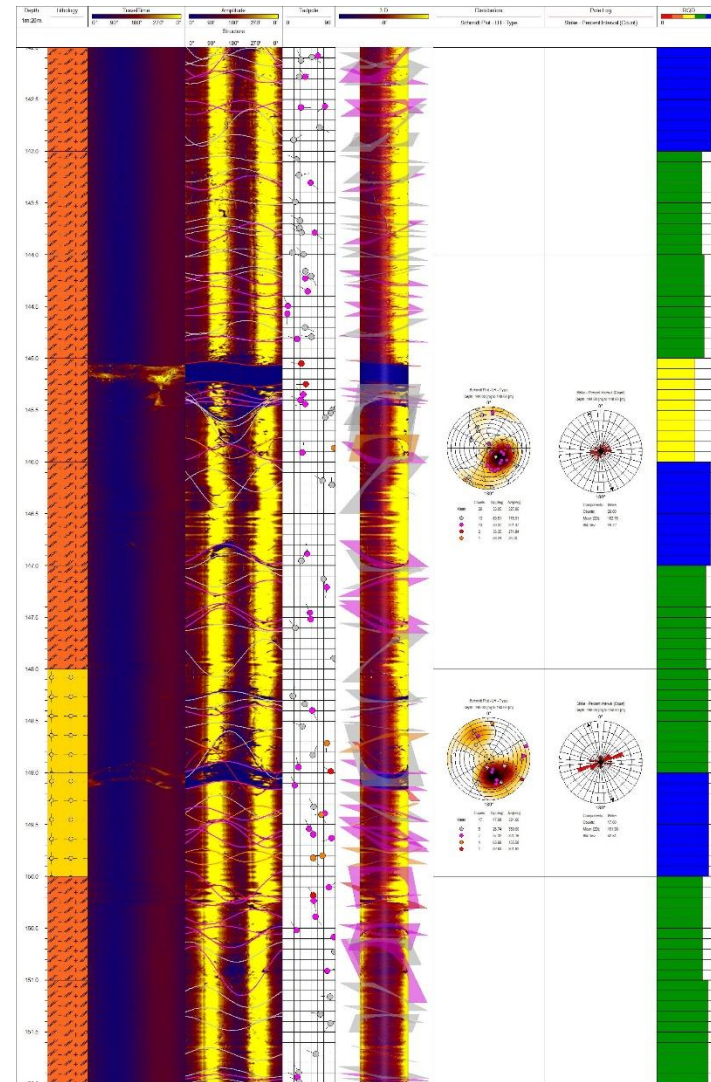
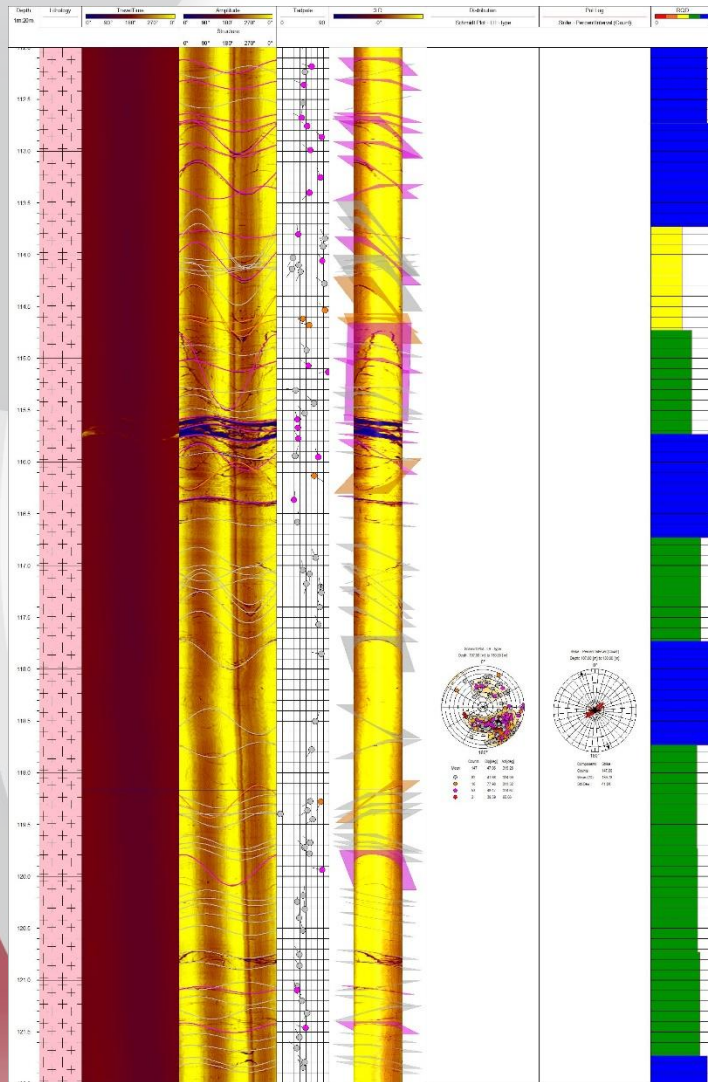
- Data from the client: counter maps, coordinates of the drill holes, lithological core logs, core fotos.
- Survey of several boreholes with: acoustic and optic scanner, gamma ray and dual latero log.
- Analysis and interpretation of:
 - Orientation of the structures,
 - Classification of the structures (bedding, joints, faults),
 - Classification of the rock mass (RQD),
 - Deviation of the boreholes,
 - Lithological assignment
- Modelling of the general structures and local weakness zones
- Report

Field Survey

- One month in the field
- One or two DMT staff on site
- Mostly central Asia



Geophysical Analysis and Interpretation of the Measurements



Cutoff line colors

Edit View

F Dip: numerical value

<0
0
10
20
30
40
50
60
70
80
90

Intervals...

Log intervals...

Copy...

Multiple...

Save as palette...

On Selection

Insert

Delete

Properties...

Color Range...

Copy From Material

