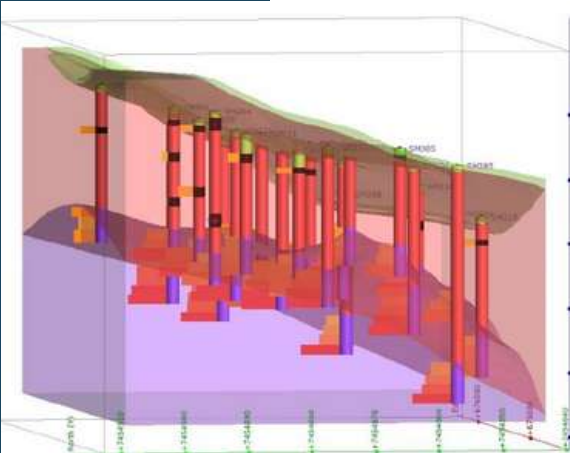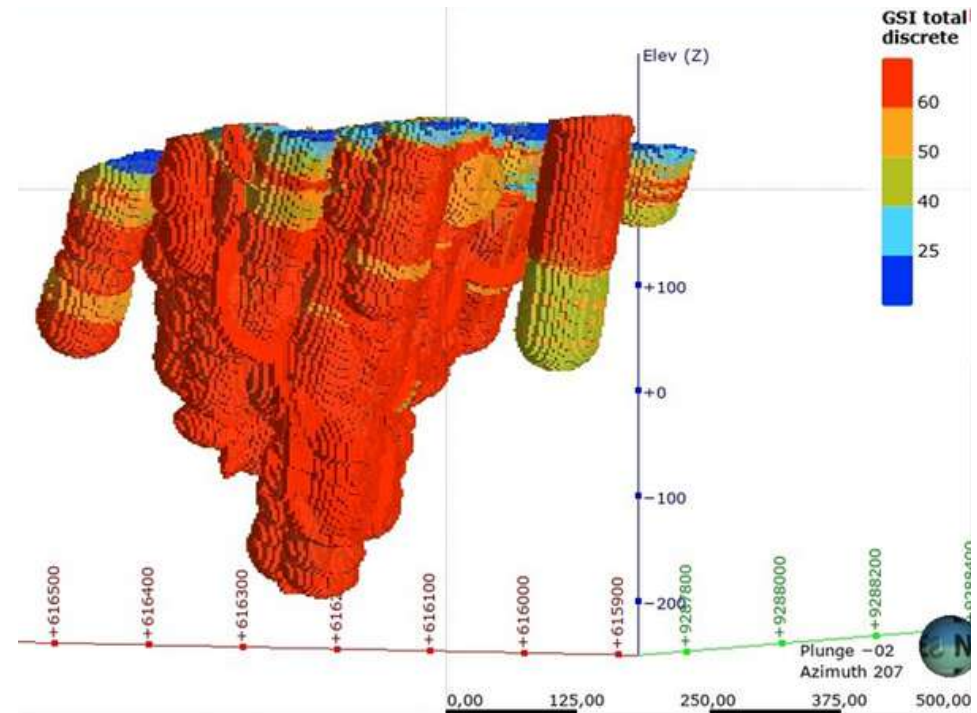# PRESENTATION LB MINERAÇÃO E SERVIÇOS

A summary of who we are and how we can help your company. We bring intelligent and technological solutions to the mining and civil construction sectors, based on the construction of 3D Geological Models and the application of geostatistical tools.

ABOUT US

Created in 2017, LB Mineração e Serviços is a Geology company that operates mainly in the areas of Mineral Exploration and Research and Geotechnics, with emphasis on the creation of geological models. Our focus is to use high technology tools to seek Efficient and Precise Solutions.

The company has experience in projects for making 3D geological models, having already performed services in more than 25 different mines.

6 YEARS OF MARKET EXPERIENCE

Initially working for closer partner companies, LB Mineração e Serviços has increasingly stood out in the market due to its quality solutions. After 6 years of growth, it now seeks to expand its partnerships to gain greater expression in geological consulting in the national and international market.

PARTNER COMPANIES AND CUSTOMERS

The company has extensive experience in the national market with a focus on the development of 3D Geological Models, having already performed services for several companies over the last 6 years.

- Mineração Vale Verde
- Taquari Vassouras
- Hidrovia
- Walm Engenharia
- Geocoba engenharia
- Geostrutural
- Technion
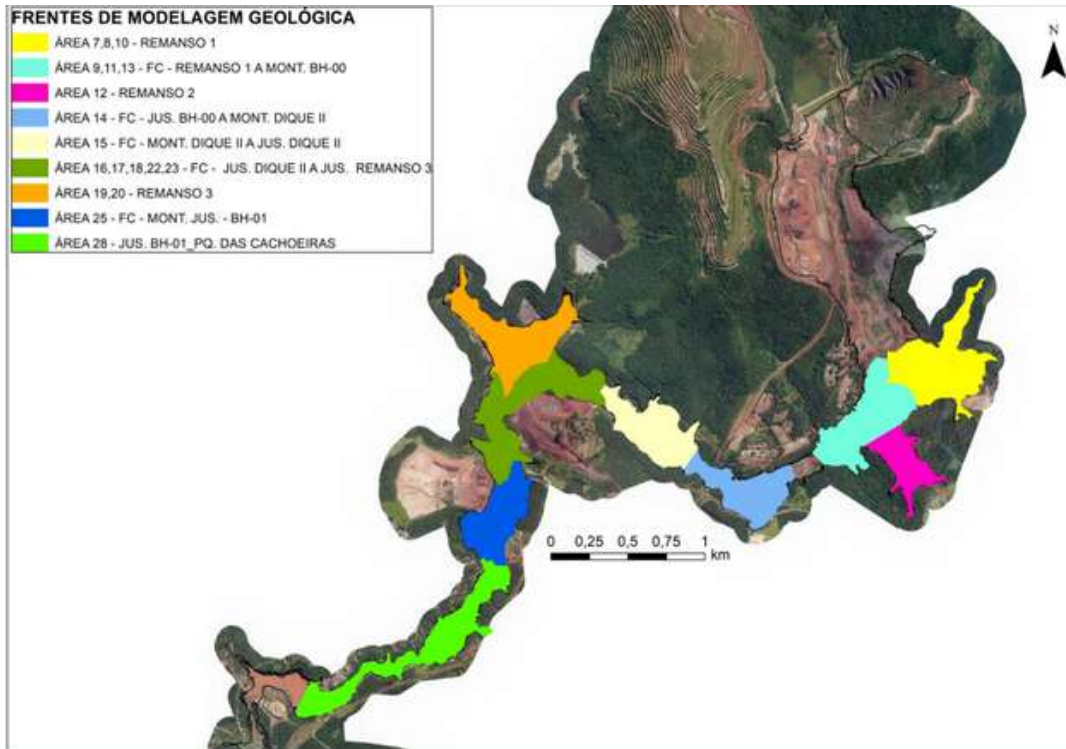- Potamos
- Vale S.A.
- Imtraff

EXECUTED PROJECTS:
TAILINGS MODELLING IN THE CÓRREGO FERRO CARVÃO

OBJECTIVE: TO PRESENT THE DEVELOPMENT OF GEOLOGICAL MODELS IN THE CÓRREGO FERRO CARVÃO. BRUMADINHO – MG

LEAPFROG GEO ⟶ Implicit modeling (surveys + geophysics + orthophotos + current topography and primitive)

FRENTES DE MODELAGEM GEOLÓGICA

- ÁREA 7,8,10 - REMANSO 1
- ÁREA 9,11,13 - FC - REMANSO 1 A MONT. BH-00
- ÁREA 12 - REMANSO 2
- ÁREA 14 - FC - JUS. BH-00 A MONT. DIQUE II
- ÁREA 15 - FC - MONT. DIQUE II A JUS. DIQUE II
- ÁREA 16,17,18,22,23 - FC - JUS. DIQUE II A JUS. REMANSO 3
- ÁREA 19,20 - REMANSO 3
- ÁREA 25 - FC - MONT. JUS. - BH-01
- ÁREA 28 - JUS. BH-01_PQ. DAS CACHOEIRAS

0 0,25 0,5 0,75 1 km

Geological/geotechnical models were developed for virtually all areas of the region shown on the map to the side, with the objective of modeling the volume and surface of deposition of the tailings from the collapsed dam.

INPUTS USED - SURVEYS

GEOLOGICAL - GEOTECHNICAL UNITS

- **TAILING**

RJ1 - SILT/CLAY
RJ2 - SAND
RJ3 - STONY
ST-RJ - SOILS TRANSPORTED BY TAILINGS
RJ-AL - PROBABLE - TAILINGS "MIXED" WITH ALLUVION

- **ALUVIONARY DEPOSITS**

AL AG - SILT/CLAY
AL AR - SAND
AL CC - GRAVEL

- **SLOPES/COLUVIO-ELUVIONARY DEPOSITS (IMPORTANT GUIDE LAYERS WHEN LATERALIZED)**

CO - HOMOGENEOUS WITH PEBBLES
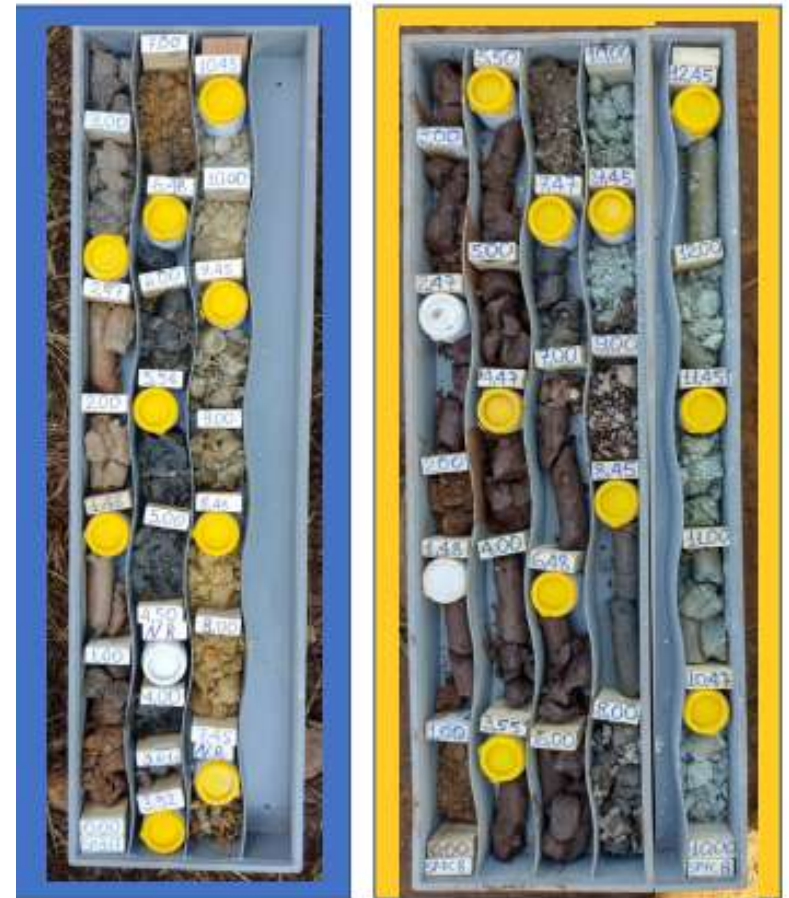CO ST - STONE LINE WELL MARKED (LITTLE THICK)

- **GNEISS GRANITE RESIDUAL SOILS - (VAZ, 1996)**

SE - MATURE RESIDUAL SOIL - WITHOUT RELIC STRUCTURES, "ISOTROPIC"
SA – YOUNG RESIDUAL SOIL – WITH RELIC STRUCTURES, ANISOTROPIC STRUCTURES

- **GRANITOID ROCK - GNAISS**

SOFT/HARD ALTERED ROCK (VAZ, 1996)

INPUTS USED - GEOPHYSICS
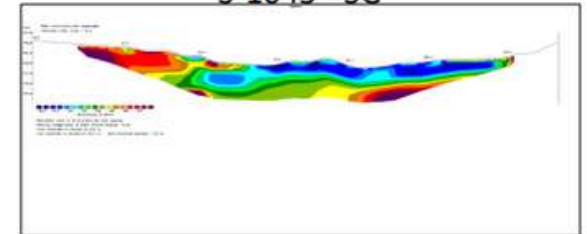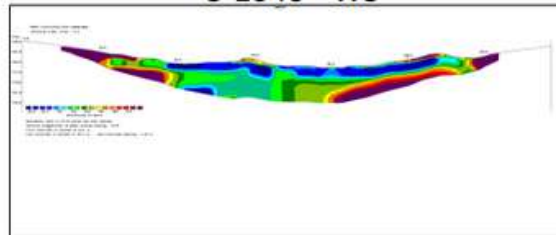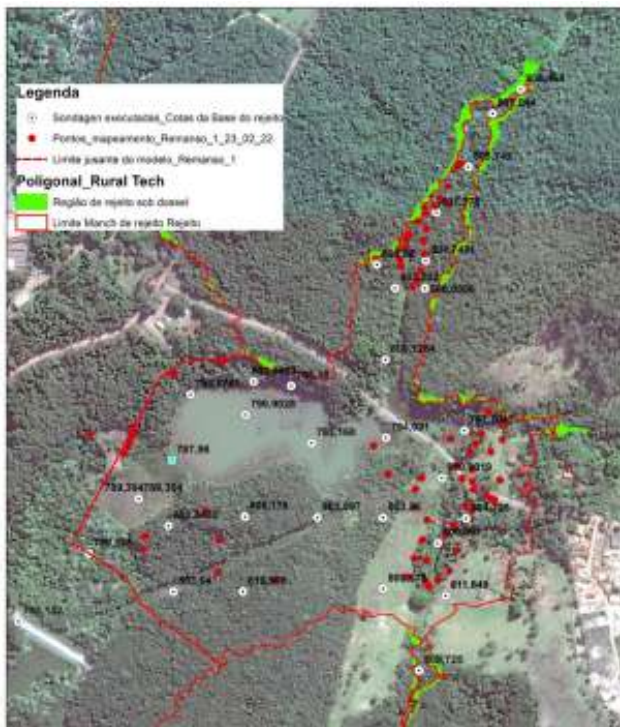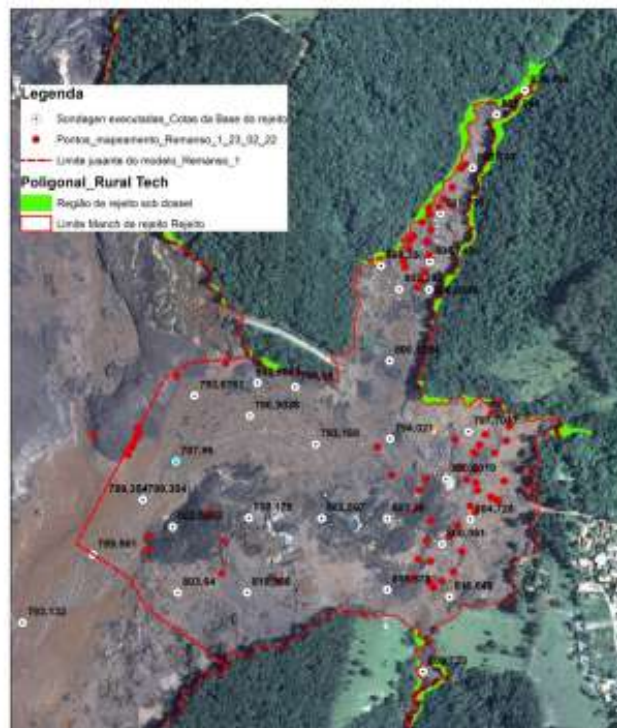
SECTIONS AND ARRANGEMENTS
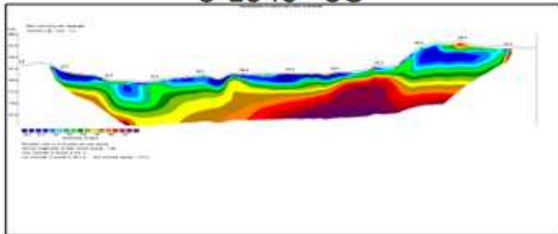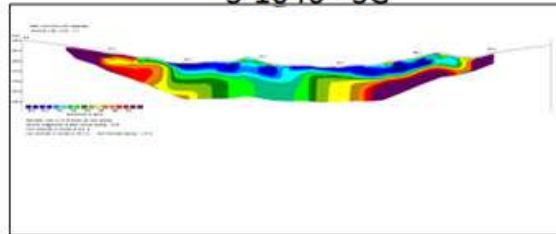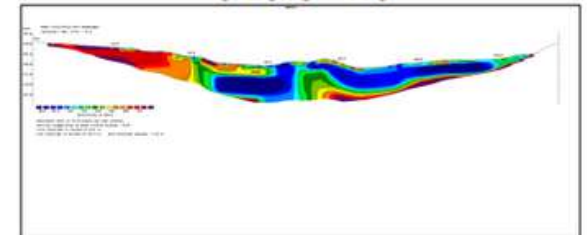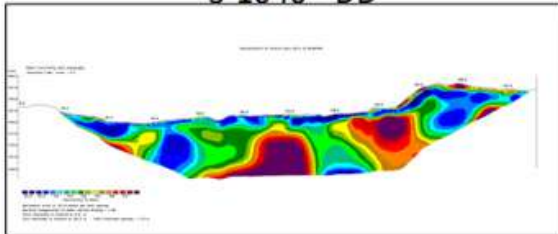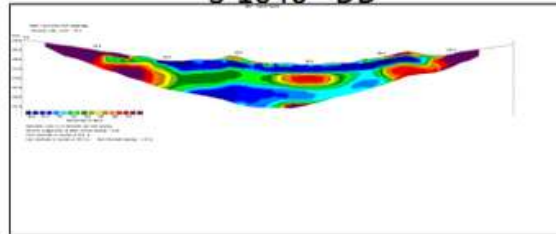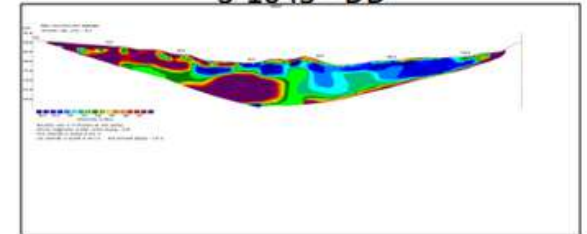
INPUTS USED - HYSTORICAL IMAGES

ORTOPHOTOS + TOPOGRAPHY

PRE-BREAKUP

POST BREAKUP
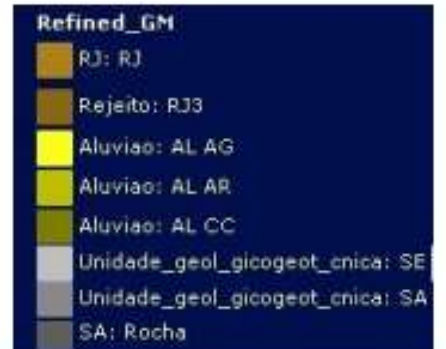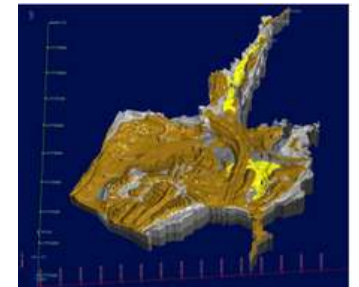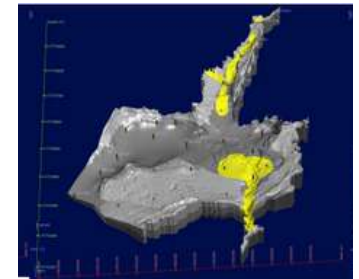
07.21
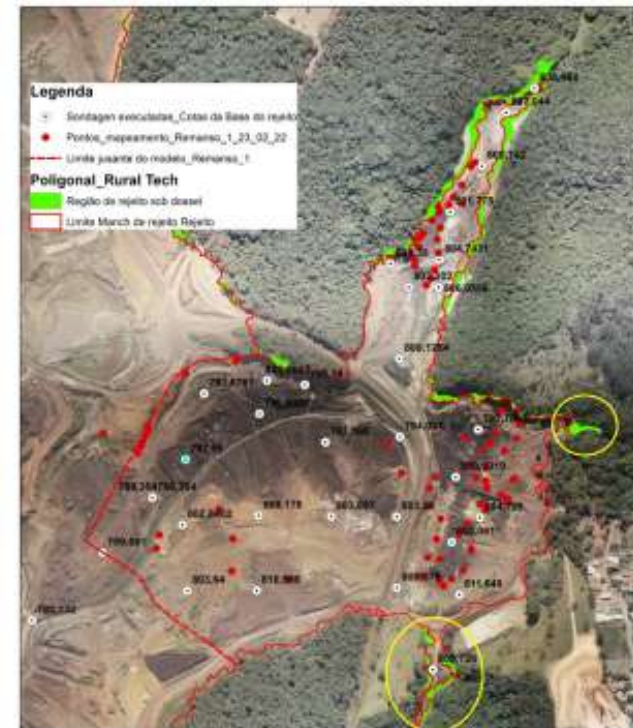
RESULTS - GEOLOGICAL MODEL WITH GENERATED SURFACES

REMANSO 3

REJEITO
- RJ1 – SILTE/ARGILA
- RJ2 – AREIA
- RJ3 – PEDREGULHOSO
- RJ-AL – Rejeito "misturado" com aluvião
- ST- RJ - Prov. solos misturados rejeito

DEPOSITOS ALUVIONARES
- AL Ag – silte/argila
- AL Ar – areia
- AL CC – cascalhos

DEPÓSITOS ENCOSTAS/COLUVIO-ELUVIONARES
- CO st
- CO

SOLOS RESIDUAIS DE GRANITÓIDE-GNAISSE
- SE – SOLO RESIDUAL MADURO
- SA – SOLO RESIDUAL JOVEM

Refined_GM
- RJ: RJ
- Rejeito: RJ3
- Aluviao: AL AG
- Aluviao: AL AR
- Aluviao: AL CC
- Unidade_geol_gicogeot_cnica: SE
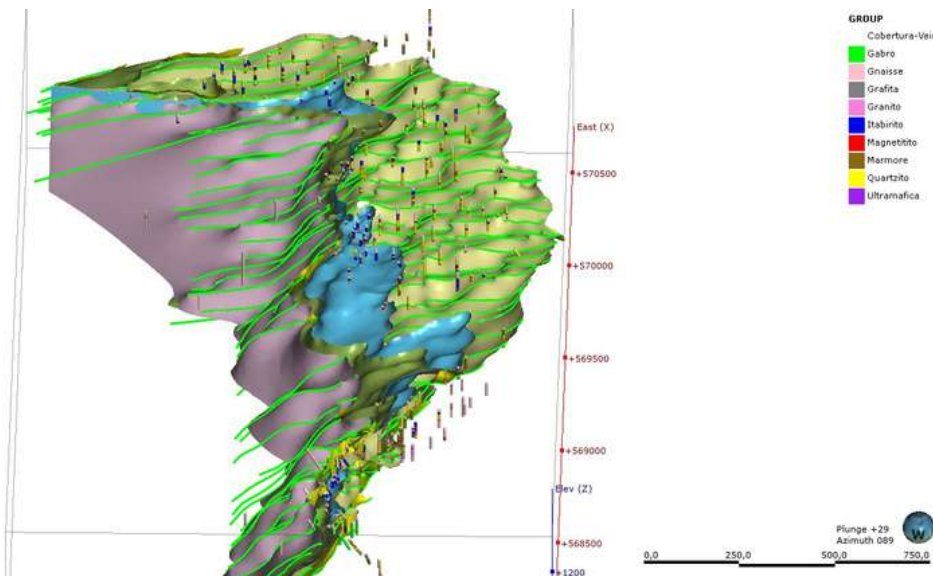- Unidade_geol_gicogeot_cnica: SA
- SA: Rocha

EXECUTED PROJECTS:
GEOLOGICAL/GEOTECHNICAL MODELLING IN THE MORRO DOS COELHOS MINE

OBJECTIVE: TO PRESENT THE DEVELOPMENT OF GEOLOGICAL MODELS IN THE MORRO DOS COELHOS MINE. DESTERRO DE ENTRE RIOS - MG

LEAPFROG GEO ⟶ Implicit modeling (226 drill holes + geological sections + current topography and primitive)


Geological/geotechnical models were developed in the Morro dos Coelhos Mine region, with the objective of evaluating the stability of the Mine's slopes. The modeling process was done from the topography, pre-developed geological sections and drill holes.
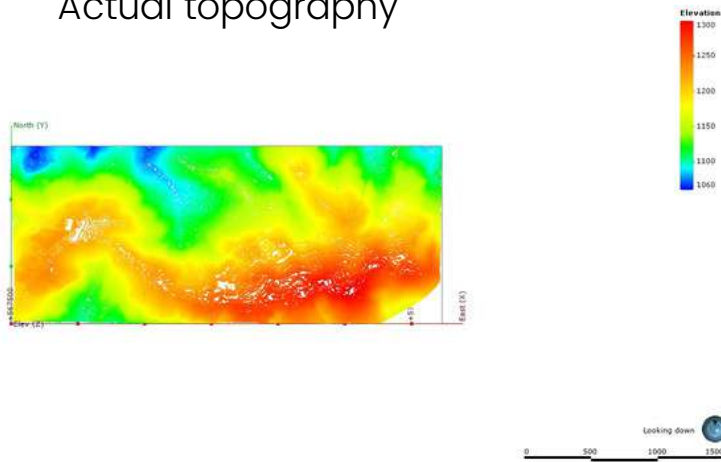
INPUTS USED - SURVEYS

54 geological sections and 226 different boreholes were used as input, with the contacts between the existing lithologies traced from interpolators of the Leapfrog Geo software.

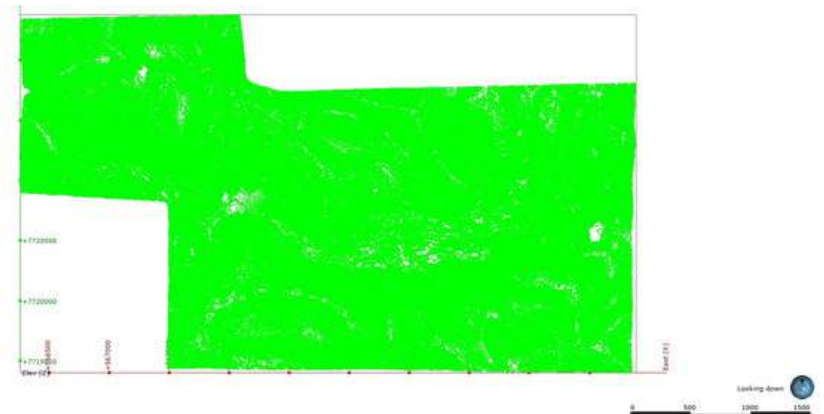Below is presented an example of carefully designed graphite lenses.
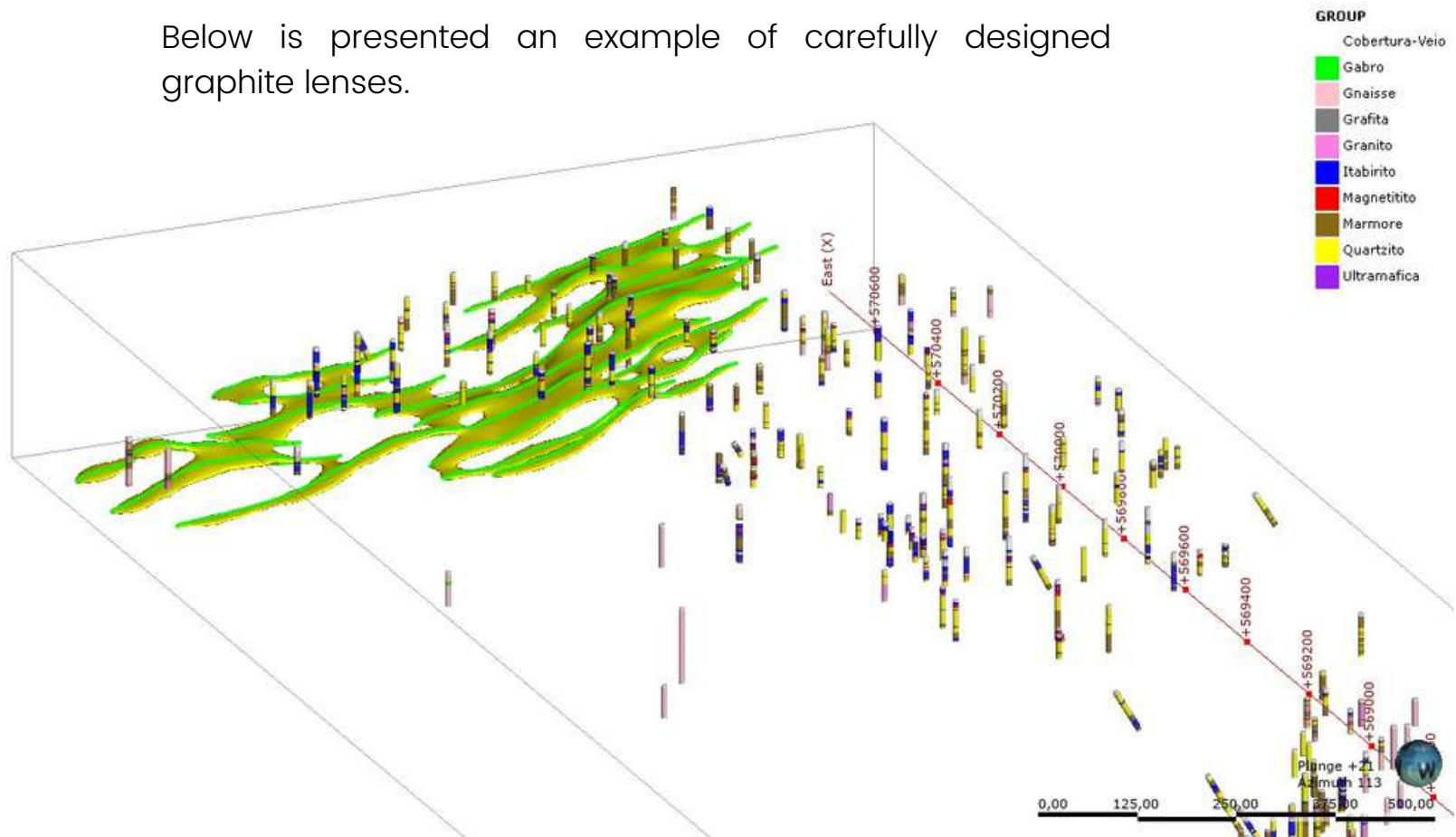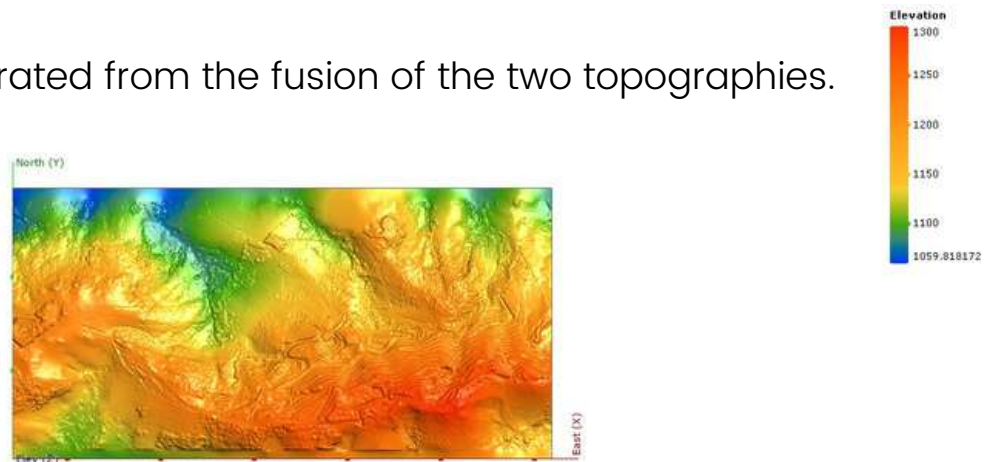
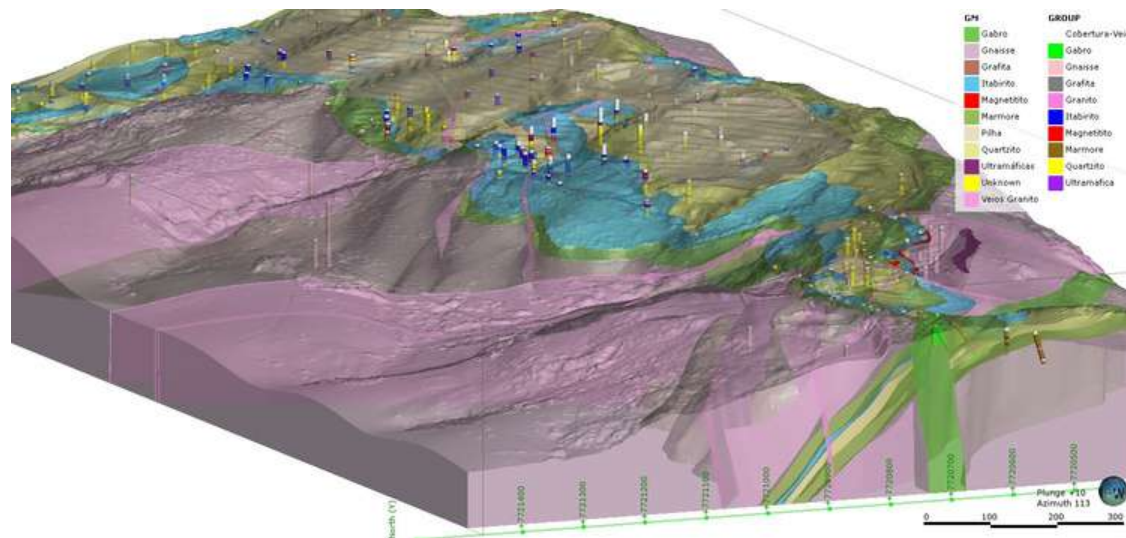# INPUTS USED - TOPOGRAPHY

Actual topography

Ancient topography

Surface generated from the fusion of the two topographies.

RESULTS - GEOLOGICAL MODEL WITH GEOLOGICAL SECTIONS GENERATED
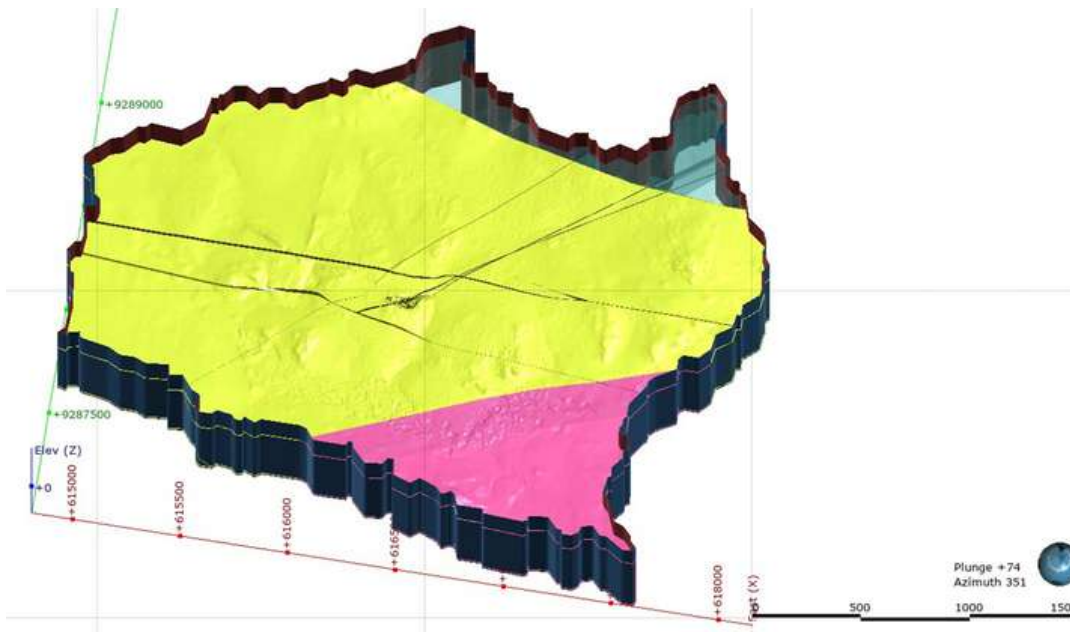
EXECUTED PROJECTS:
GEOMECHANICAL MODELLING OF THE BARÃO NORTE MINNING PIT - CARAJÁS - PA

OBJECTIVE: TO PRESENT THE DEVELOPMENT OF GEOMECHANICAL MODEL IN THE BARÃO NORTE MINNING PIT - CARAJÁS - PA

LEAPFROG GEO → Implicit modeling of domains and block model creation (104 drill holes + geological map + pre-existent geological model of the minning pit area)


A geomechanical model was developed for the Barão Norte pit region - Carajás/PA. The input data used were boreholes, containing geotechnical descriptions, with alteration and quality data of the massif. In addition, a previous geological model was also considered.

The parameter used to build the model was the GSI (geological strength index).

INPUTS USED - SURVEYS

From the existing borehole data, a separation of three main domains was made: Lithologies with similar behavior, weathering layers and geomechanical zones, which were separated from the GSI values.
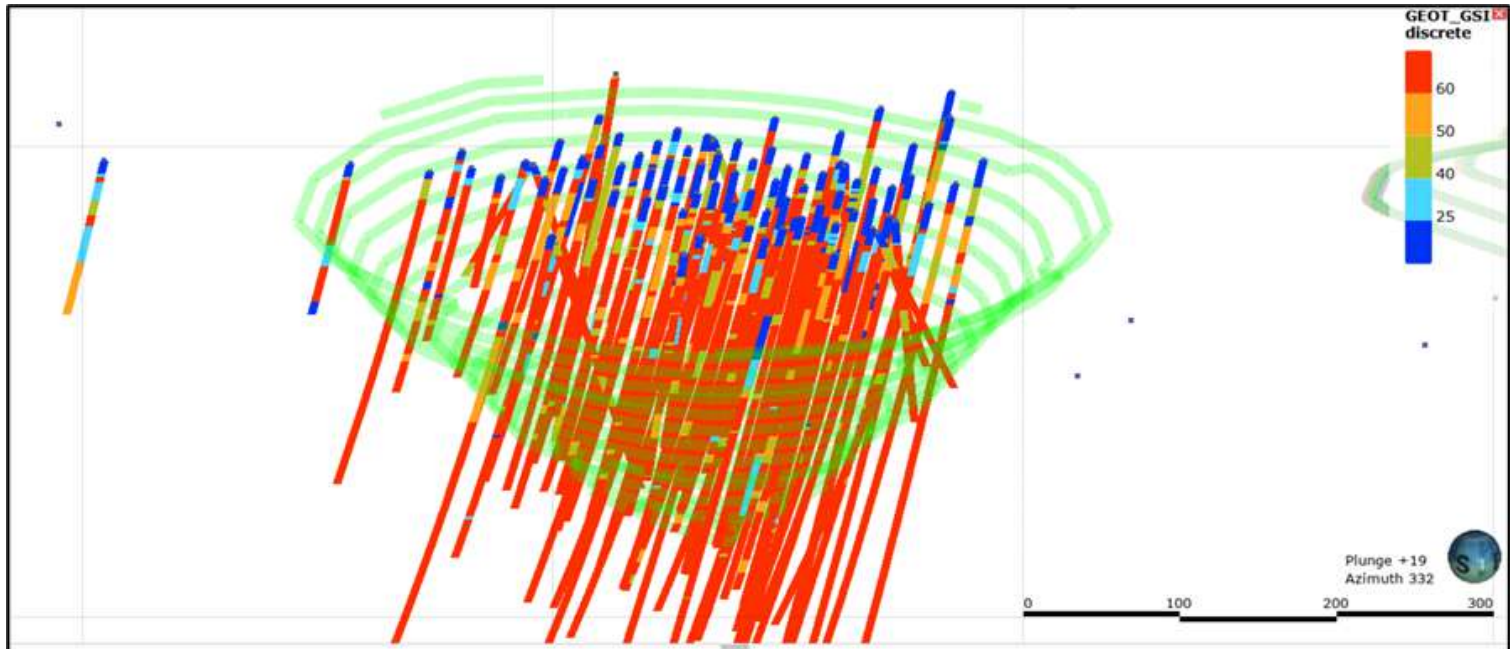
METHODS FOR DISTINCTION OF THE GEOMECHANICAL DOMAINS

- GSI: The GSI proved to be the most suitable mass classification method for the execution of the model, since the GSI parameter could be used in the global stability analysis of the rock mass, based on the generalized criterion of Hoek & Brown (2000).

- INTERPOLATOR USED: Inverse Distance Weighting (IDW), considering the entire pit as a single domain. Other interpolators as nearest neighbor and kriging were also considered, but the IDW proved to be the most suitable interpolator
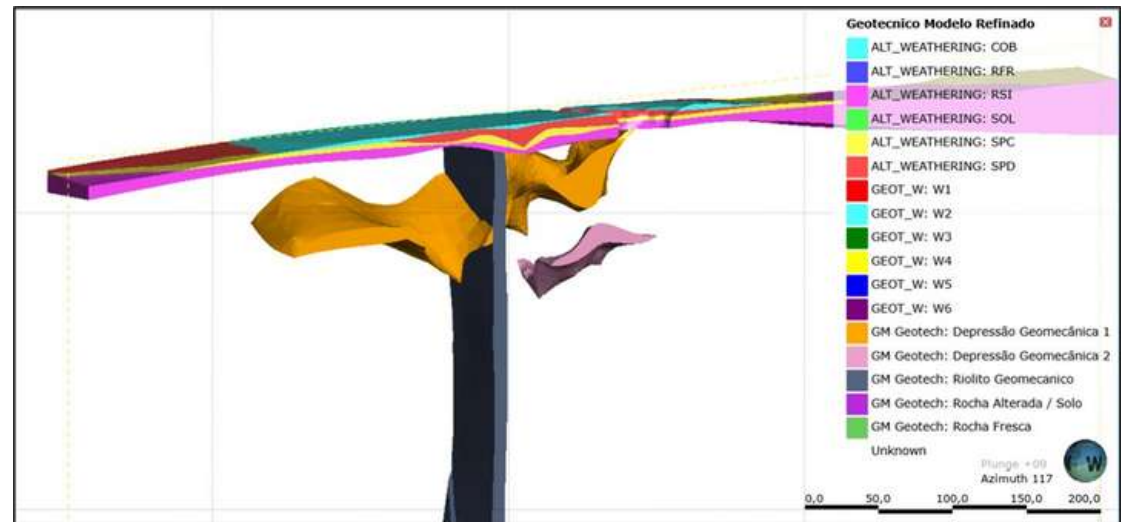
GSI ESTIMATION FOR EACH DOMAIN

As a result, an estimate of the GSI was prepared for each of the geotechnical domains. For this, it was necessary to seek the best fit for the search ellipsoid for each situation, so that all blocks were estimated with the greatest possible precision.
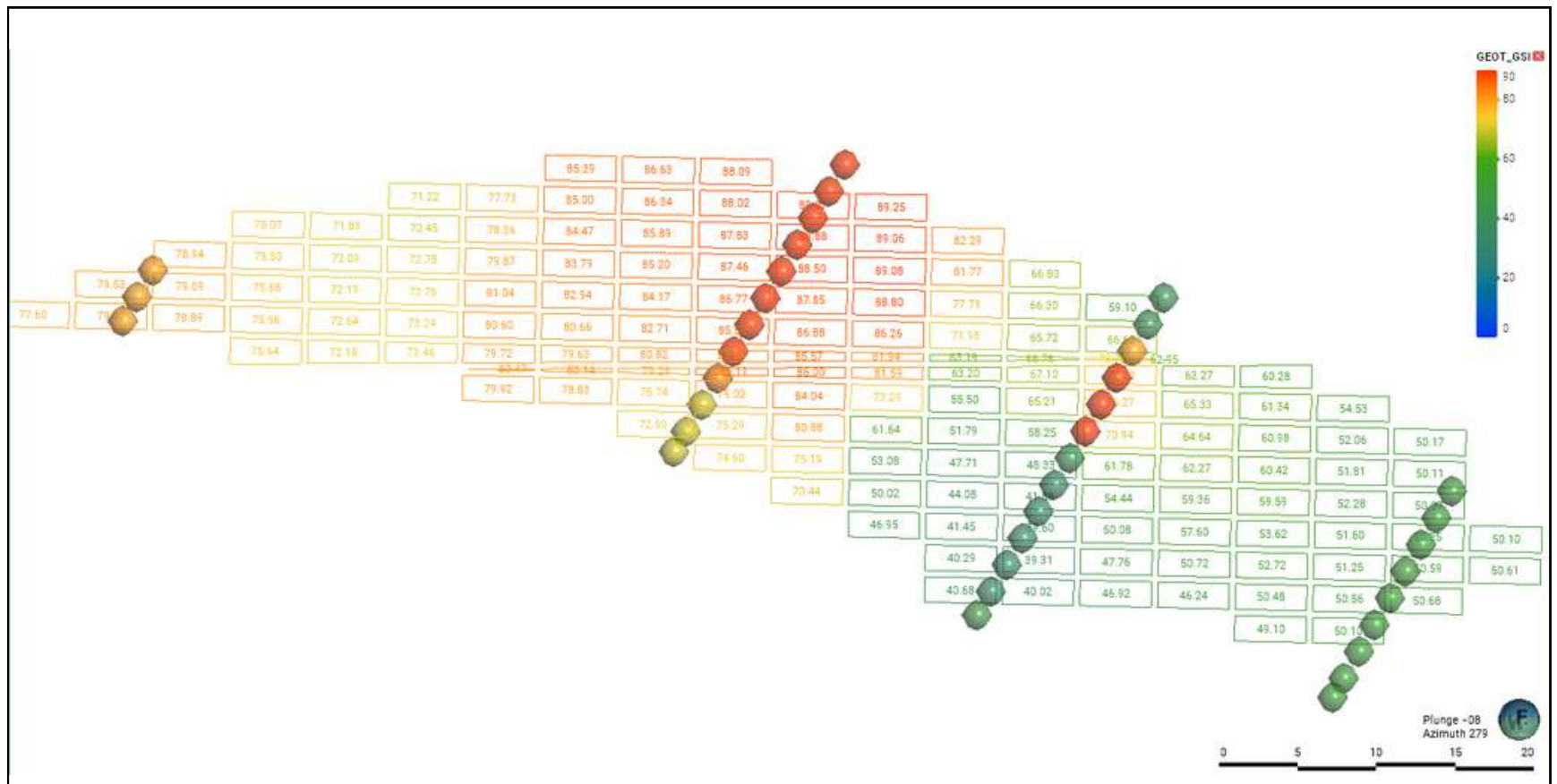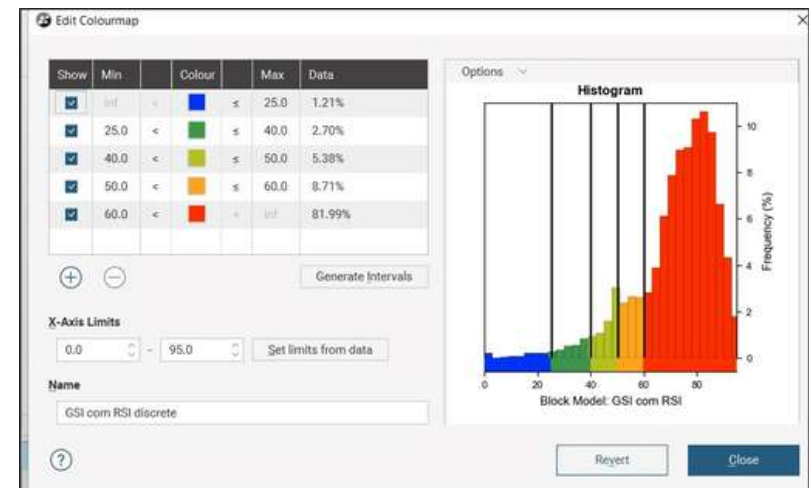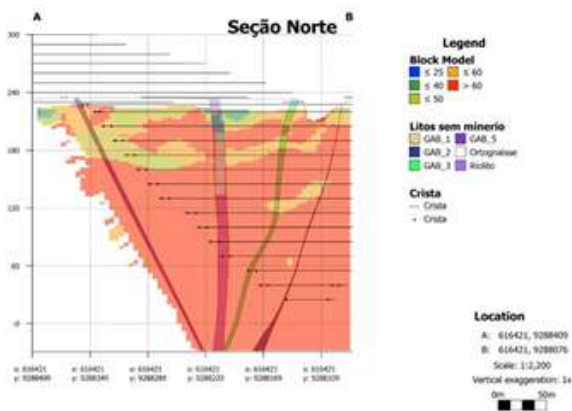
RESULTS - FINAL GEOMECHANICAL BLOCK MODEL

With all domains estimated separately, all results were then grouped into a unified block model, using calculation tools. From this final model, it is possible to carry out quantitative evaluations, section extraction and data visualization in an integrated way.
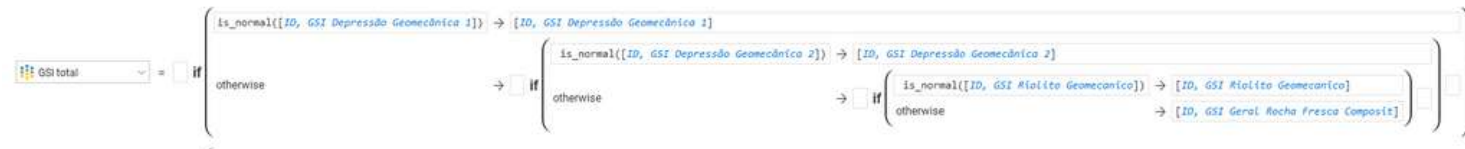
RESULTS - FINAL GEOMECHANICAL BLOCK MODEL

Similar methods have already been used in other projects to estimate resources and mineral reserves, using other interpolators such as kriging

CONCLUSION
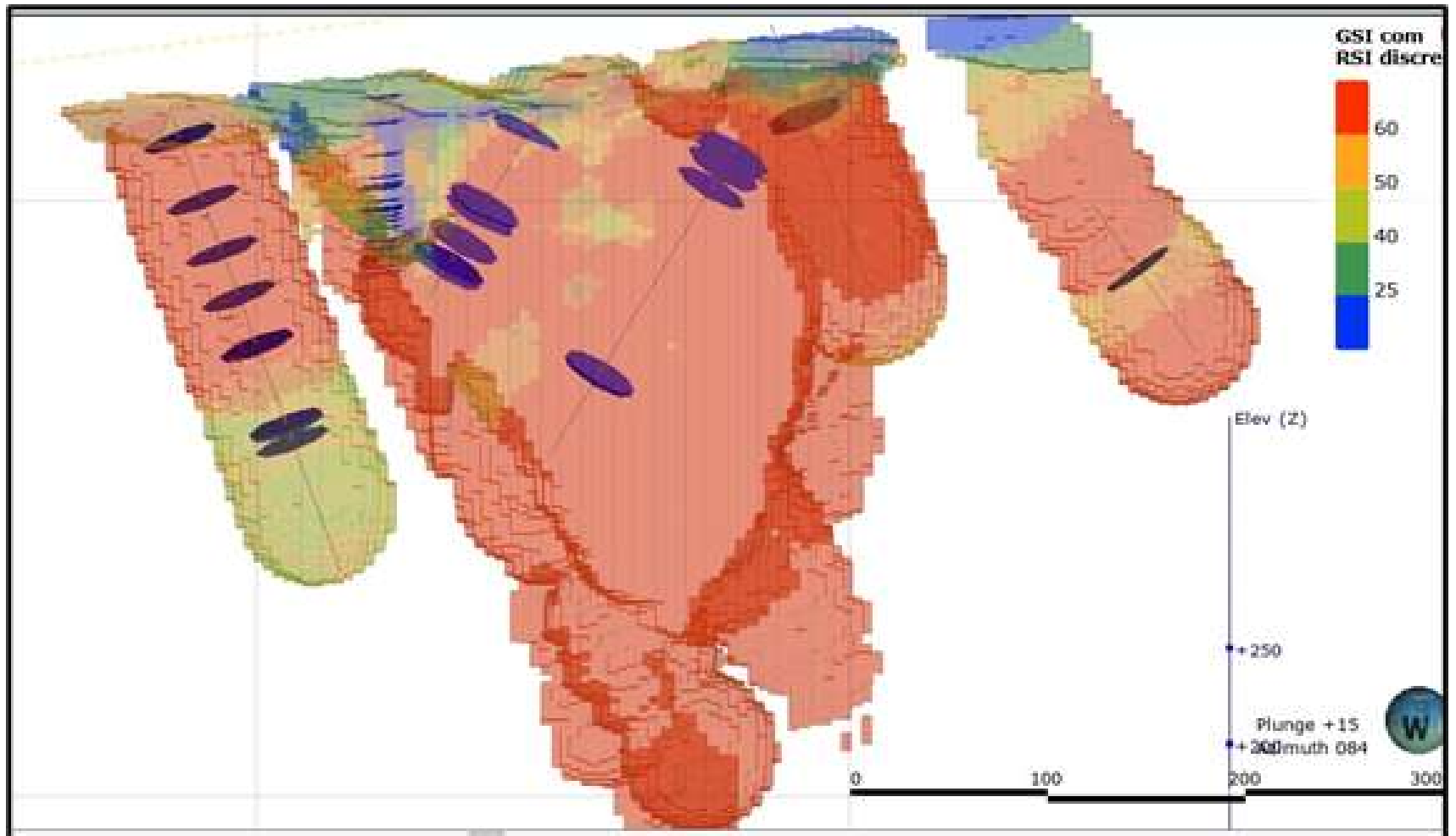
Since its founding, LB has grown in an organic and structured way, always prioritizing the training of its technical staff in order to create solid institutional knowledge. Today, the company counts on top-level professionals with academic postgraduate degrees and extensive practical knowledge, able to coordinate and execute projects in our areas of expertise. We always seek to optimize solutions for our customers in an intelligent and technological way, with the aim of expanding the area of operation beyond the national scope.

TEAM

JONAS LARANJEIRA

Founding Partner is a Geologist, Master in Mining Engineering has experience in geotechnical work, mineral research and environmental analysis using 3D geological modeling as a tool

IAN BRAGA

Founding Partner is a Geologist Specialist in Geotechnics with extensive experience in 3D modeling for geological and geotechnical assessments with courses taken in QA/QC.

DIOGO SEPE

Geologist works in the development of the technical field and office, with capabilities for project development in GIS and assistance in geological modeling

CONTACT US!

Contact us to get to know us better!

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WE HOPE WE CAN COLLABORATE WITH OUR EXPERIENCE AND WORK TO ACHIEVE SOLUTIONS FOR YOUR BUSINESS.