

# COAL GEOLOGICAL MODELLING

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**BRITMINDO GROUP**  
Professional Mining Services



# GEOLOGICAL MODELLING

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- **Geologic modelling** or **Geomodelling** is the applied science of creating computerized representations of portions of the Earth's crust based on geophysical and geological observations made on and below the Earth surface
- **Geomodelling** is commonly used for managing natural resources and natural hazards and quantifying geological processes, with main applications to oil and gas fields, groundwater aquifers and ore deposits

# GEOLOGICAL MODELLING

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- **Geologic modelling** is a relatively recent sub discipline of geology which integrates structural geology, sedimentology, stratigraphy, paleoclimatology, and diagenesis
- Geologists involved in mining and mineral exploration use geologic modelling to determine the geometry and placement of mineral deposits in the subsurface of the earth.

# GEOLOGICAL MODELLING

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- Geologic models help define the volume and concentration of minerals, to which economic constraints are applied to determine the economic value of the mineralization. Mineral deposits that are deemed to be economic may be developed into a mine

# ALL GEOLOGICAL MODEL HAVE A PURPOSE

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The purpose of the coal geological model guides a number of facets of the coal project :

- A coal geological model designed for exploration tends to focus on clearly defining the coal and non coal units
- An operating coal mine has geological models that focus on the long term production or 'Life of Mine' (LOM) or short term production issues (STM)

# ALL GEOLOGICAL MODEL HAVE A PURPOSE

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- The LOM models are typically updated annually for a mining operation or project. New drilling and analytical information enables more data to be added into the geological databases and models
- STM models typically utilise a LOM coal quality model, but have additional data for controlling the seam relative to a bench or mining block(s)

# MODEL RESOLUTION (OR SCALE) AND DATA USED IN GEOLOGICAL MODELS

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- The models purpose interplays with the resolution of the model. For example: an LOM geological model will be less concerned with faults that are less than the height of the seam.
- A short term model will focus on specific mining block(s) of the mine is generally created to ensure that the day to day mining schedule follows surfaces that are accurate in that area only

# MODEL RESOLUTION (OR SCALE) AND DATA USED IN GEOLOGICAL MODELS

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- Geological models that encompass an entire coal basin, will have a resolution or scale that considers faulting and seam geometry differently to geological models that are comprised of a portion of the coal basin.

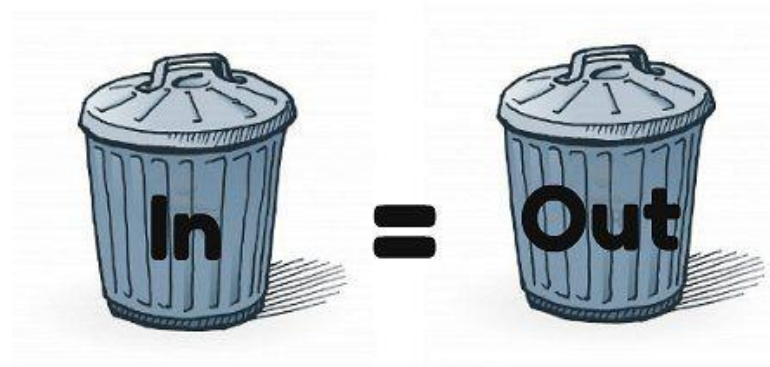


# GEOLOGICAL MODEL ASPECTS

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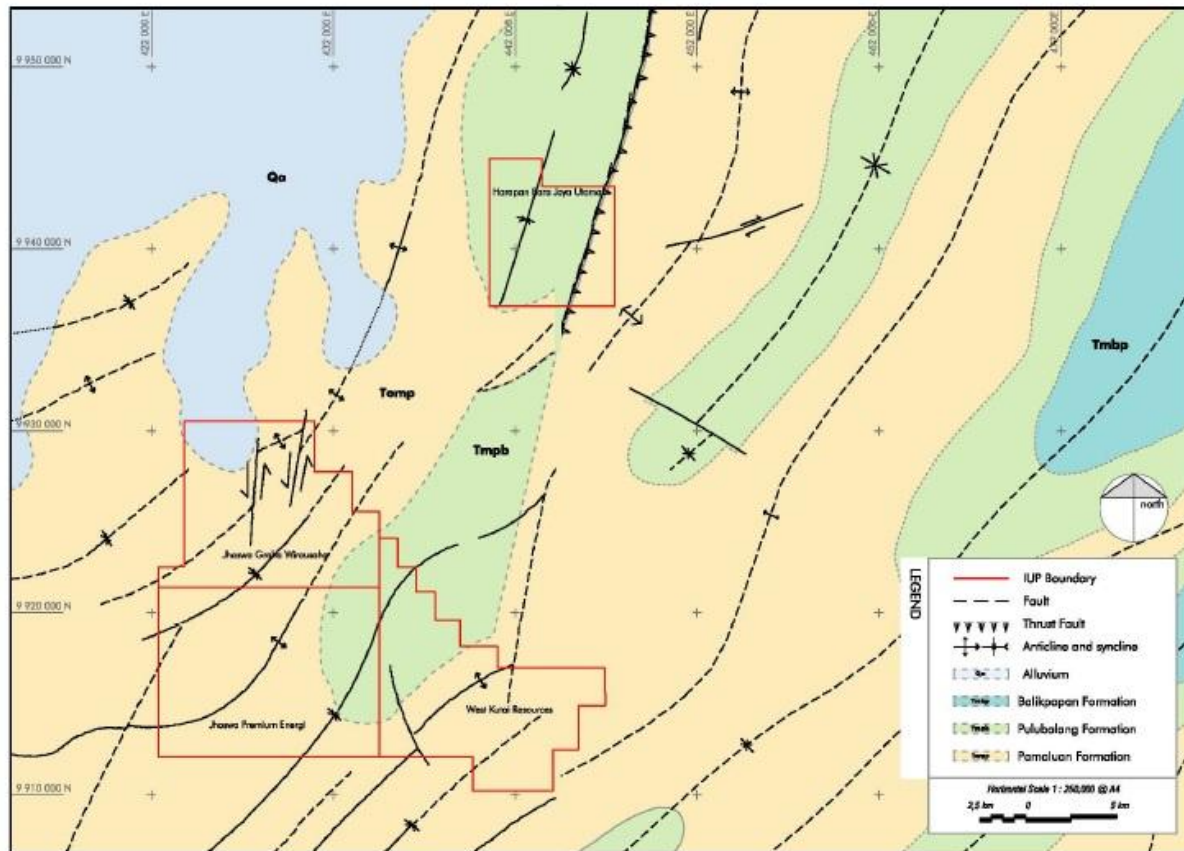
- Data gathering and validation
- Preliminary analysis of geological context
- Interpretation of available data
- Construction of structural model
- Tools – Software

To produce a reliable model required a clean data and a good interpretation



# GEOLOGICAL DATA

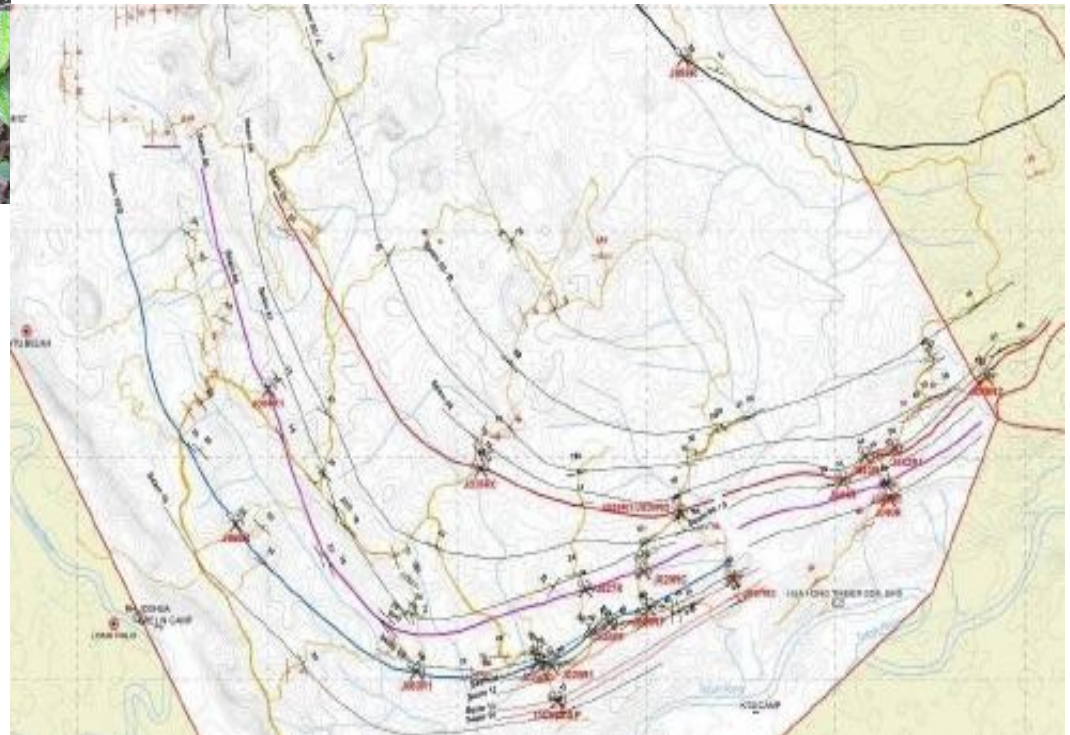
- Regional Geology /Stratigraphy



# GEOLOGICAL DATA

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- Outcrop



# GEOLOGICAL DATA

- Borehole



# GEOLOGICAL DATA

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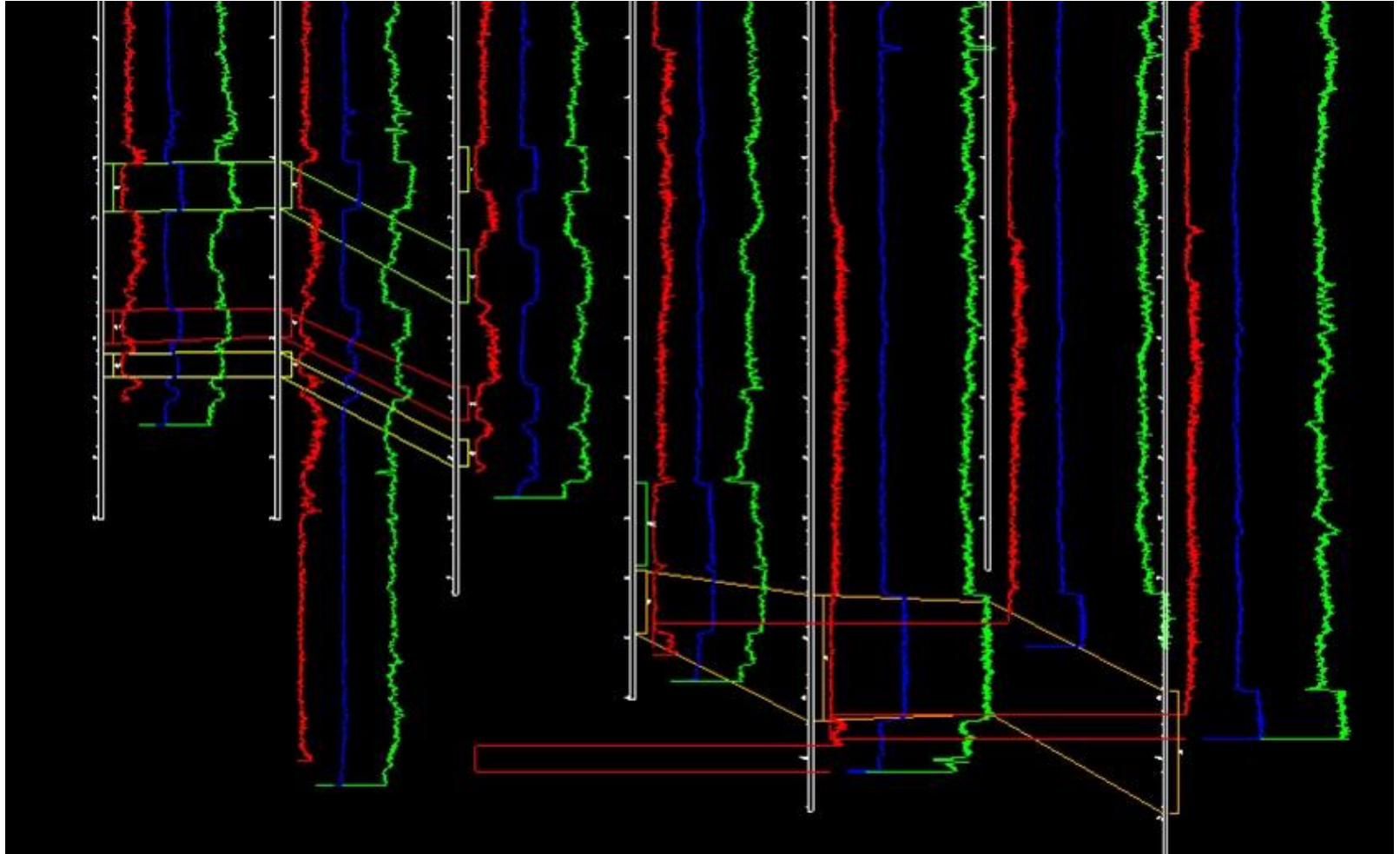
- Structure Geology



# GEOLOGICAL DATA

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- Geophysical Log



# GEOLOGICAL MODEL ASPECTS

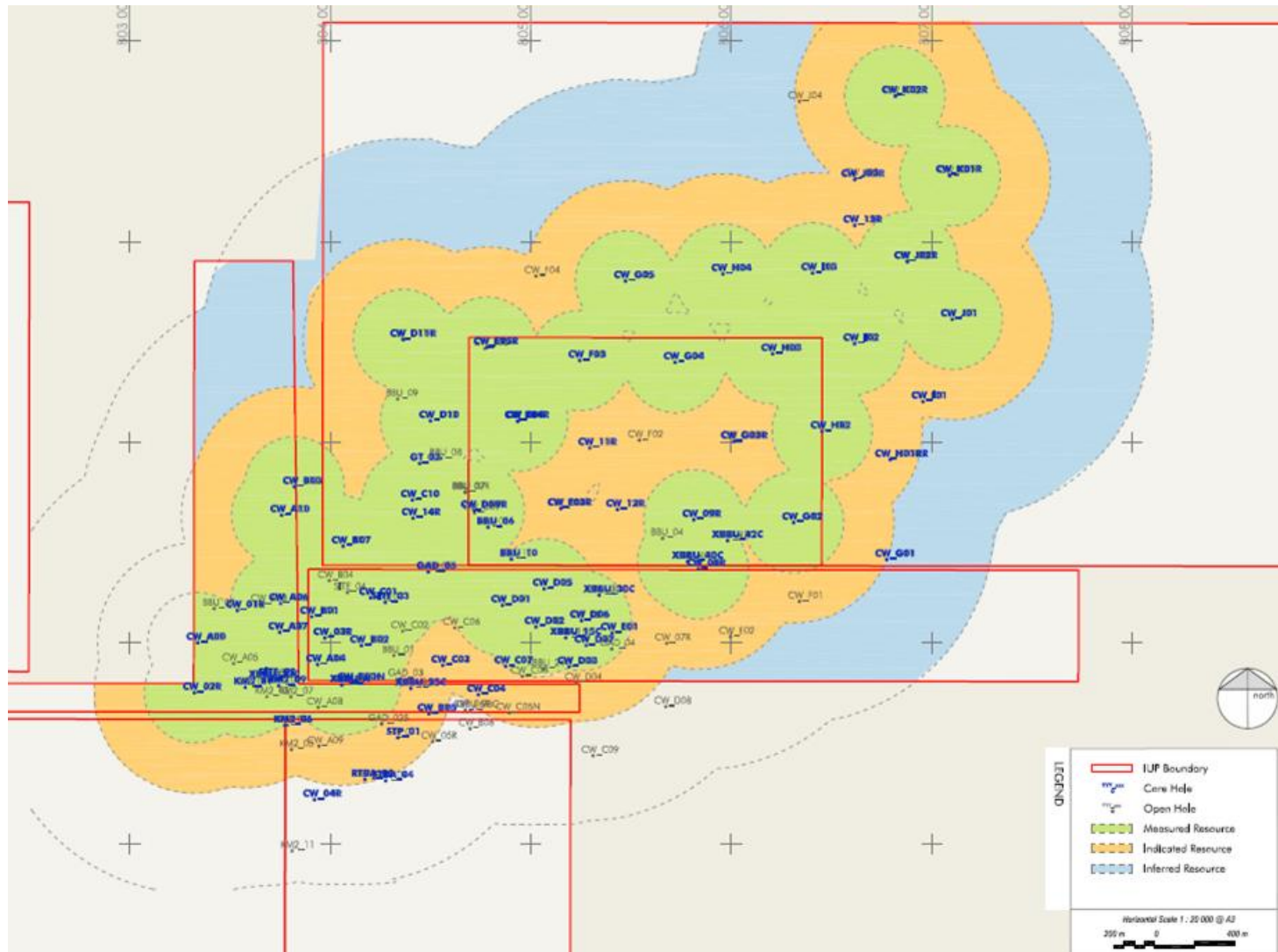
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## MODEL CALCULATIONS

”Garbage In-garbage Out” Paradigm

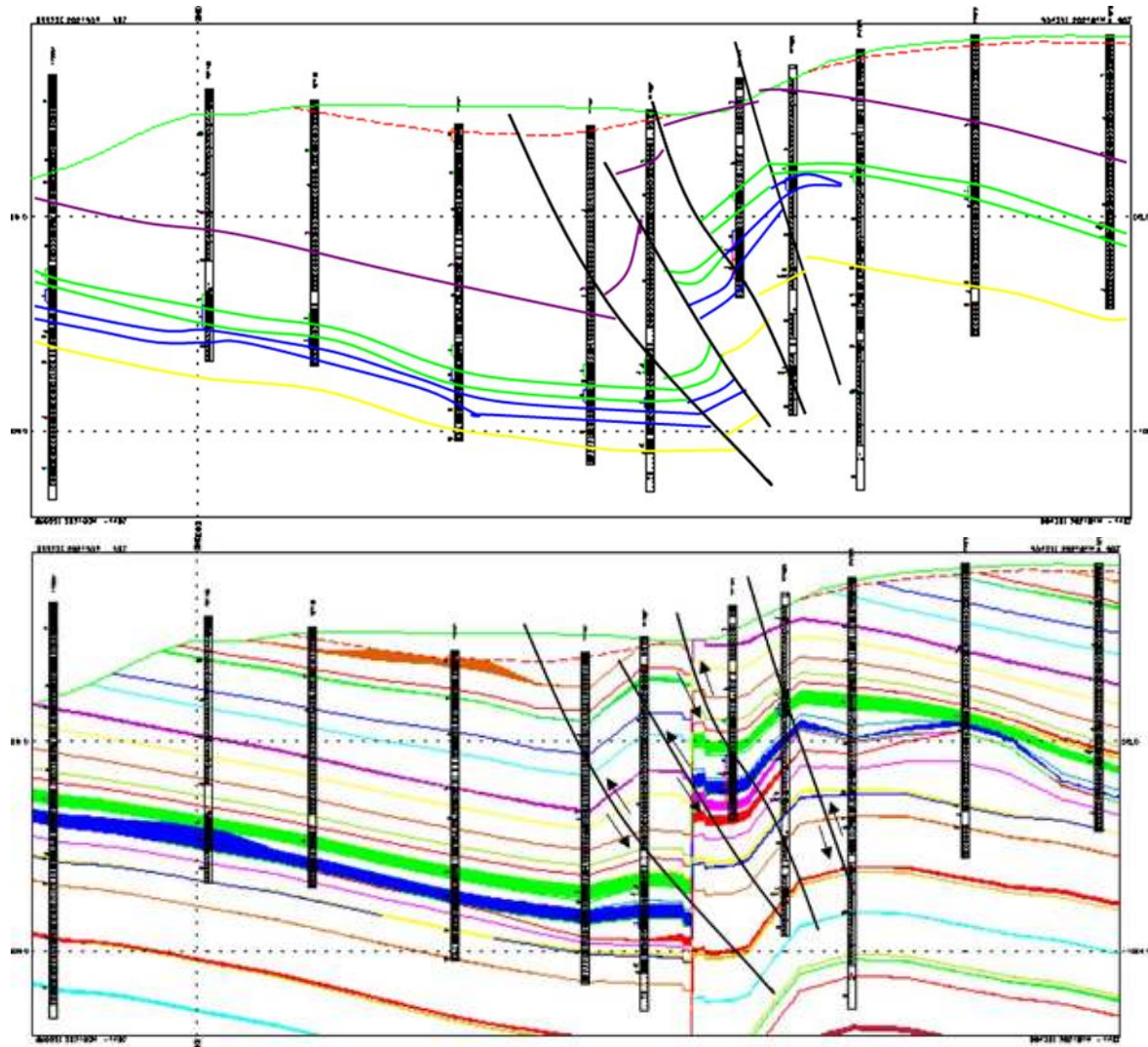


# RESOURCES ESTIMATION



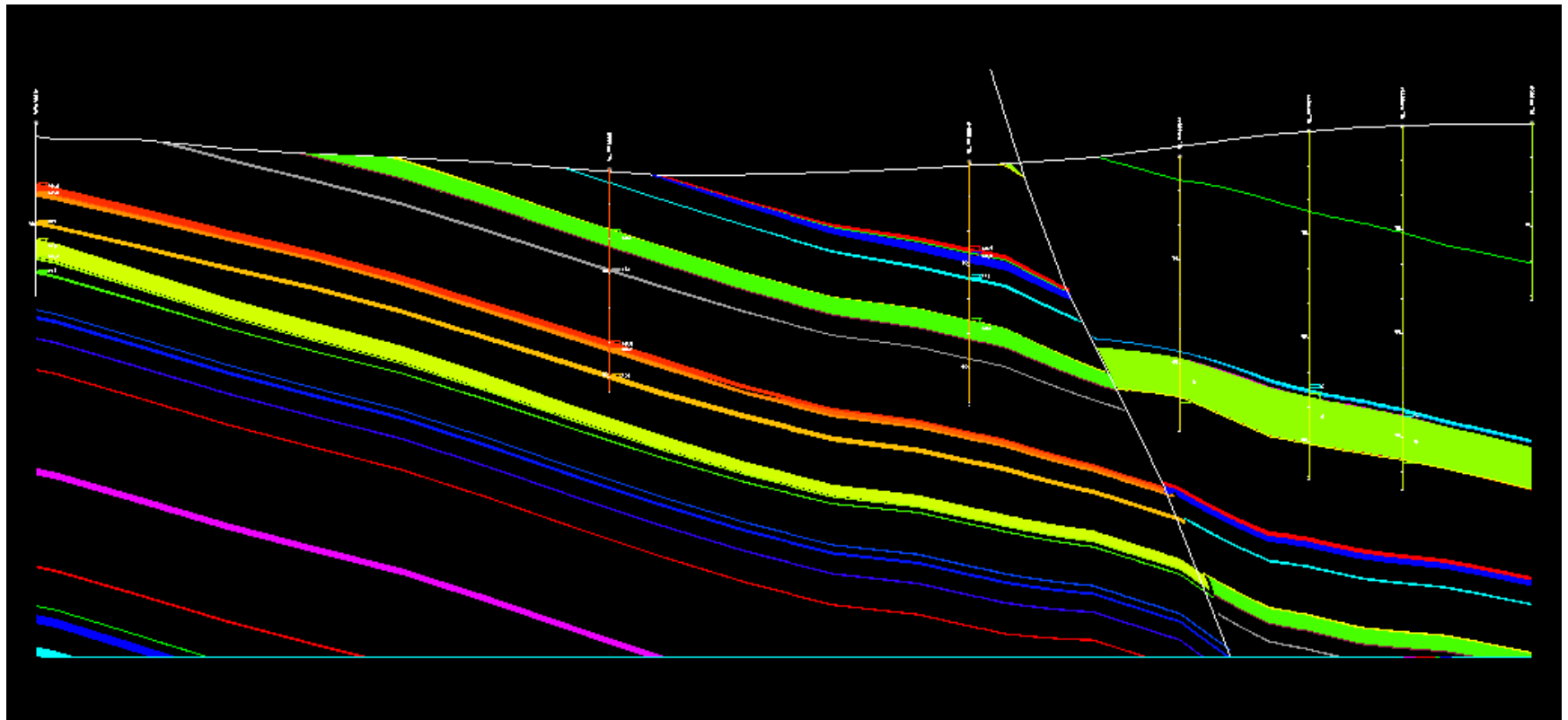


# GEOLOGICAL MODELING



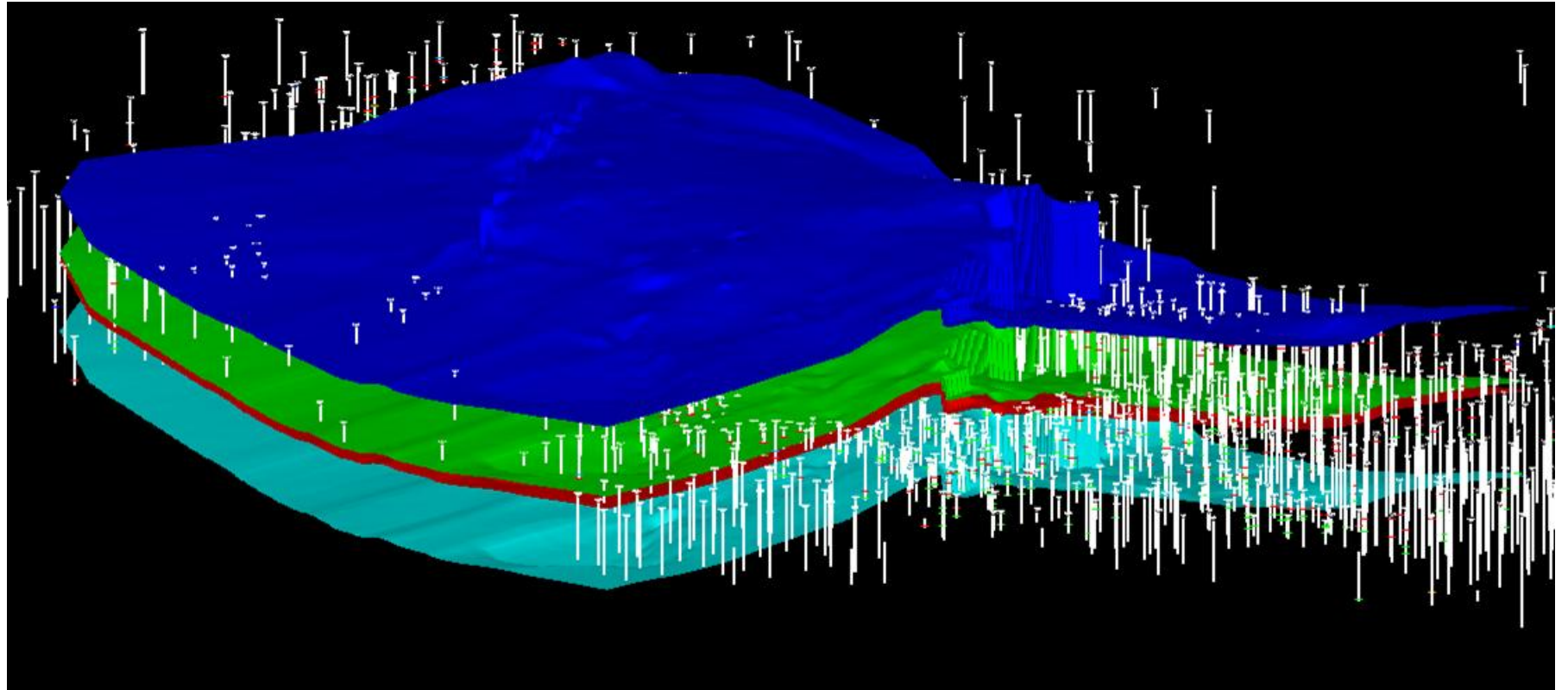
# GEOLOGICAL MODELING

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# GEOLOGICAL MODELING

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# THANK YOU

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