MINING 101

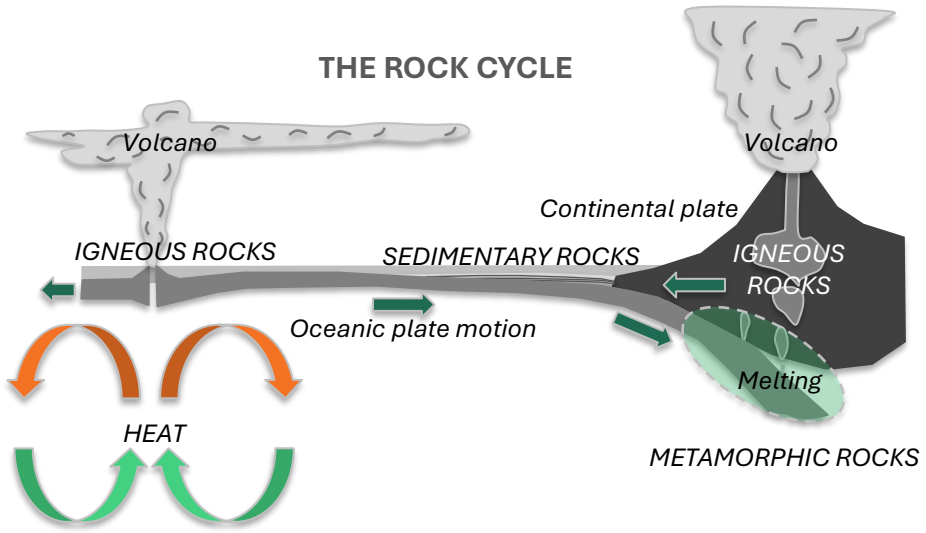
INTRODUCTORY FACTSHEET

SATARLA

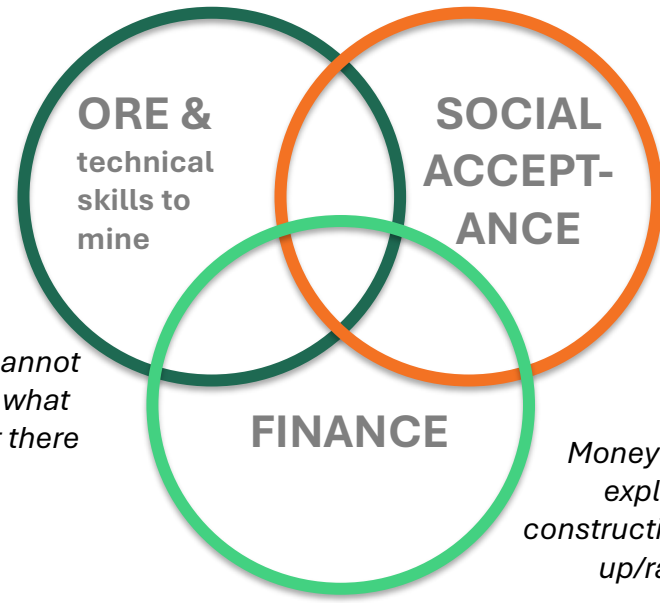
GEOLOGY

ROCKS – MINERALS – ELEMENTS

Earth was formed 4.56 billion years ago and continues to evolve today. Chemical elements are concentrated in specific areas through processes such as plate tectonics and volcanoes. Rocks are formed of minerals which in turn are composed of chemical elements.



EVERY SUCCESSFUL MINE NEEDS:



Permission to mine, shared value with stakeholders

You cannot mine what is not there

Money to finance exploration, construction, and start-up/ramp-up.

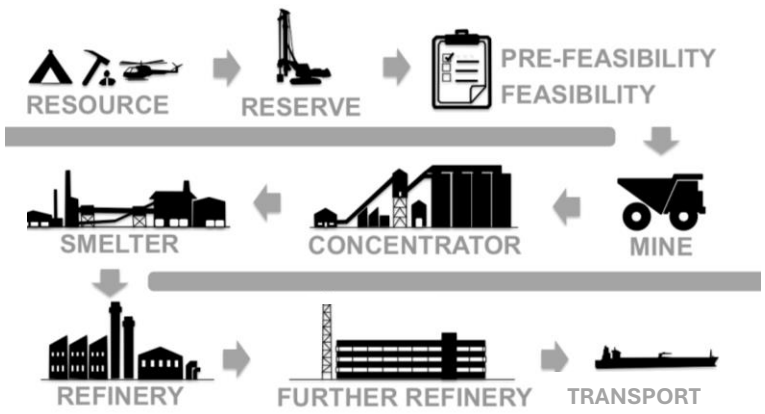
RISK PROFILE

As well as *ore*, *social acceptance*, and *finance*, mining requires many other inputs, and generates numerous outputs. Any disruption to these components can pose a risk to the responsible supply of minerals.

INPUTS

- **EQUIPMENT** – TRUCKS TO TYRES
- **UTILITIES** – WATER AND POWER
- **PEOPLE** – EMPLOYEES, CONTRACTORS, SME'S
- **PARTNERSHIPS** – INVESTORS, VENDORS
- **INFRASTRUCTURE** – ROADS, RAIL & PORTS
- **DEMAND** – FOR COMMODITIES, DEVELOPMENT

MINING VALUE CHAIN



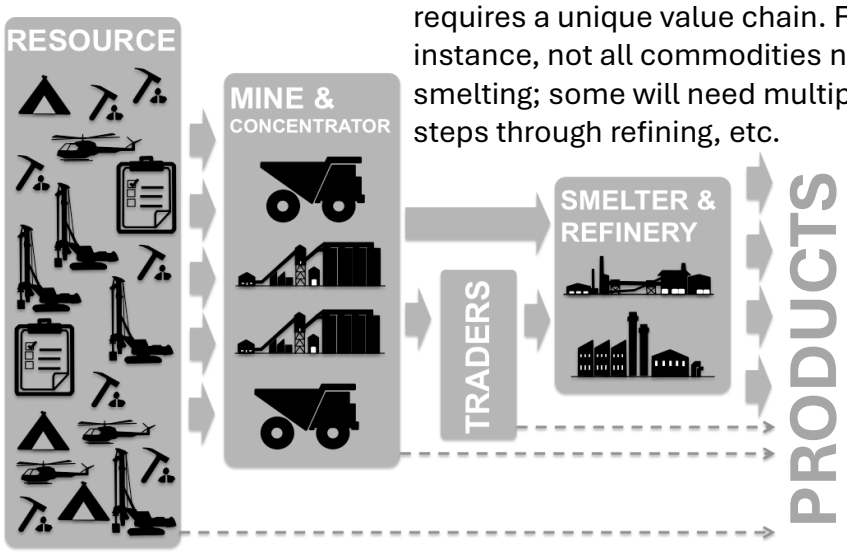
OUTPUTS

- **PRODUCT** – E.G. COPPER
- **WASTE** – E.G. TAILINGS
- **ENVIRONMENT** – DEGRADED / ENHANCED
- **COMMUNITIES** – DEVELOPED / IMPACTED
- **WEALTH** – STAKEHOLDER BENEFITS
- **TECHNOLOGY** – ADVANCEMENTS

Some of these risks can be controlled directly, others can only be influenced or monitored. A responsible miner will be openly aware of these risks and be controlling them according to best practice, in line with legislative requirements, and leveraging best available technology that is economically feasible.

VARIATION

Every commodity, ore body, and product is different, and therefore requires a unique value chain. For instance, not all commodities need smelting; some will need multiple steps through refining, etc.



KEY TERMINOLOGY

GRADE Concentration of the desired element in the rock, concentrate, or tailings.

RECOVERY The fraction of the desired element that is recovered during concentration.

REFINING Processes that increase the grade or purity of a metal.

RESERVE The part of a resource that can be economically and legally extracted under current circumstances.

RESOURCE A concentration of naturally-occurring solid, liquid, or gas in the Earth's crust, in such form and amount that economic extraction of the commodity is currently or potentially feasible.

SMELTING Metal extraction process in which an ore is mixed with purifying substances and heated to a high temperature in an enclosed furnace. Impurities (slag) and metal (matte) are produced.

TAILINGS The waste material left over after the process of separating the valuable fraction from the uneconomic fraction (gangue) of an ore. Can include the following: *mine dumps, slimes, tails, refuse, leach residue, slickens*.

MINING VALUE CHAIN

FIND RESOURCES

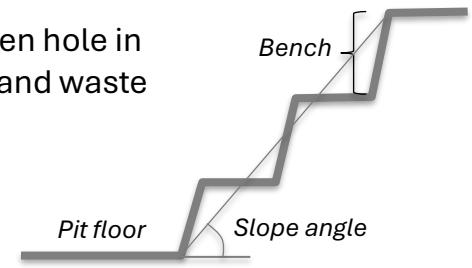
1. **TARGET GENERATION:** Identify where you might find a resource using a regional opportunity and risk tool. Incorporates geology, infrastructure, political, investment, and ESG risk.
2. **DRILL TARGET IDENTIFICATION:** Undertake prospectivity analysis with regional geophysics, geochemistry, and geology data including remote sensing (from satellite or aircraft), to identify indicator minerals and anomalies. Many deposits are not visible on the surface as they are covered by non-mineralised rocks.
3. **RESOURCE DEFINITION:** Drilling to confirm the presence and distribution of mineral deposits beneath the surface and increase data density for greater confidence.

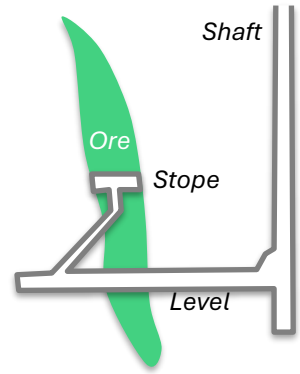
PROJECT RESERVES & BUILD

4. **EVALUATION:** Conceptual (e.g., preliminary economic assessment, PEA, and scoping), pre-feasibility, and feasibility studies. Include metallurgists, miners, and engineers to ascertain if the resource can be mined and processed economically.
5. **DEVELOPMENT:** This includes pre-production technical studies to fine-tune the mining and processing methods, Environmental Impact Assessment (EIA) and approvals/ permits, land acquisition, and re-settlement, followed by mine development, construction, and ramp -up.

MINE EXTRACT THE ORE

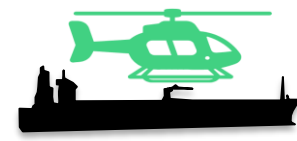
SURFACE (open pit). An open hole in the ground where both ore and waste are excavated.





UNDERGROUND. Multiple methods exist, typically comprising of underground tunnels, which allow ore and the minimal waste required to be extracted.

TRANSPORT



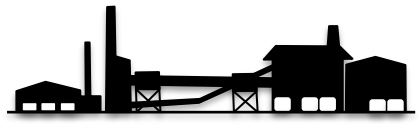
Products are transported by pipeline, conveyor, road, rail, ship, plane, or helicopter, depending on the volume and infrastructure available.

POST-CLOSURE

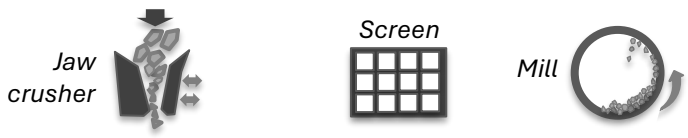
ENVIRONMENTAL & SOCIAL LEGACY is a major component of closing mines and process plants. Budgeting and planning for this should be undertaken in the project stage and rolling remediation carried out wherever possible. Whilst closure has traditionally been seen as a compliance activity, it is good practice to consider opportunities going forward, too.

PROCESS CONCENTRATE

Concentrating the desired element or mineral to the state in which it can be sold typically takes place in a series of plants including concentrators, smelters, and refineries. Each ore type or product requires a different process using one or a combination of the following methods:



PHYSICAL PROCESSING: Liberation techniques, such as crushing, grinding, and screening, that use the physical properties of the mineral, including size, density, colour, magnetic susceptibility, etc., to break rocks down to their mineral components and separate them from waste (gangue) through washing, gravity or flotation.



CHEMICAL PROCESSING (hydrometallurgy): Concentration of desired elements by chemical means. Methods include leaching, solvent extraction, electrowinning, ion exchange, precipitation, and crystallisation.

THERMAL PROCESSING (pyrometallurgy): Concentration of desired elements by heat. Methods include drying, roasting, smelting, and casting.