



# Exploration to Mining

The purpose of undertaking exploration is to find an economically viable mineral resource.

We need certain strategic minerals, including copper, to maintain our quality of life and to migrate to a **low-carbon economy**.

Renewable **energy solutions**, such as wind and solar farms, electric vehicles and high-technology are needed to facilitate this transition. All require large quantities of copper.



# Stages of mineral exploration

The search for minerals involves a wide range of activities from desk-top literature reviews, ground and aerial surveys to drilling programs.

An Exploration Licence is required before an explorer can start exploring for minerals.

But first, an explorer has a few decisions to make.

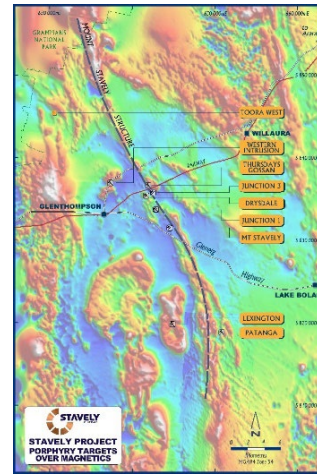
**Commodity selection** – what metals are they seeking? In Stavely’s case, the target is copper.

**What style of metal deposit are they seeking?** – small high-grade or large low-grade, or even better, a large high-grade deposit.

The odds of a greenfield mineral target ever becoming a profitable mine is 1:1000<sup>1</sup>

<sup>1</sup> Source Minerals Council of Australia

**Desktop** - This is the first study to be undertaken. These studies are based on available government geological and geophysical datasets, as well as any historic information that has been collected from the site.



**Area selection** – assessing the prospectivity of a geologic region to host the metal and the type of mineralisation you are seeking.

**Reconnaissance exploration** - typically short duration with low-disturbance techniques. This stage eliminates large, un-prospective areas. Reconnaissance activities include geological mapping and geochemical sampling (rock chip, soil and stream sediment sampling), ground and airborne geophysical surveys.

**Prospect definition and ranking** - by interpretation of geochemical and geophysical data (this stage focusses on a few ‘best chance’ opportunities).

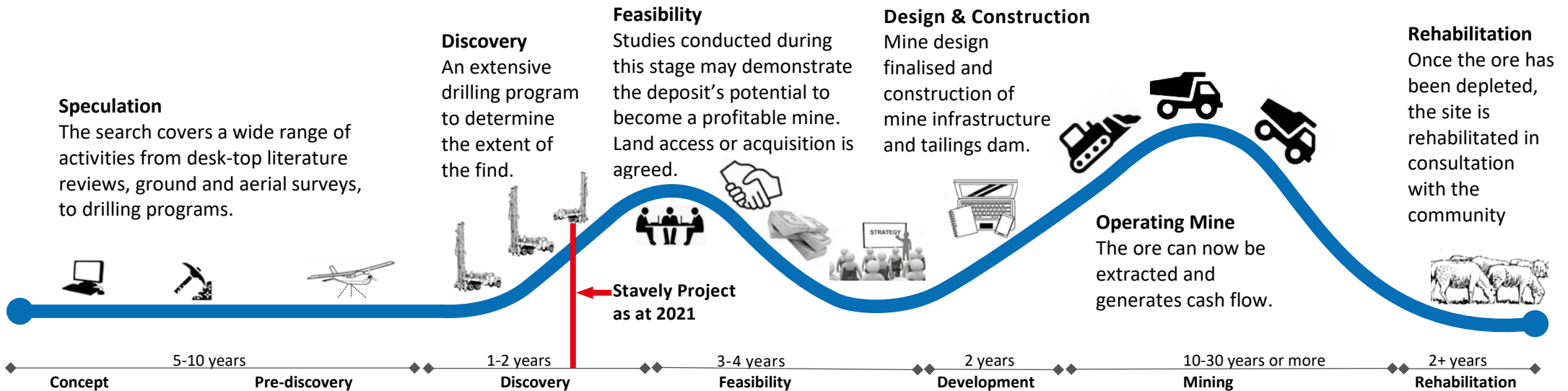
## Prospect evaluation

Before an explorer can access private land, they must seek consent of the landholder.

Prospect evaluation involves detailed geochemistry, ground geophysics, geological mapping, rock-chip sampling and possibly some wide-spaced, reconnaissance drilling.

Drilling is expensive and most prospects fail at this stage.

The next step, after reconnaissance activities, involves low impact exploration, including more extensive drilling programs.



**Discovery** – this is a rare occurrence and is still a long way from becoming a mine.

An extensive drilling program is undertaken to determine the extent of the find.

The Stavely Project reached this stage late in 2019, with Stavely Minerals having invested more than \$38 million in the search to date.

**Feasibility (Economic Studies)** – once the resource has been defined, a number of studies are undertaken to determine if it is viable to extract.

These studies can involve:

- Mine design – open cut/underground
- Metallurgy and Process Plant Designs
- Environmental impact assessment
- Social impact assessment
- Aboriginal and cultural heritage
- Negotiating land access/acquisition
- Economic Analysis and Financing

These studies can occur over many years and are undertaken multiple times with varying levels of accuracies (from scoping studies through to definitive feasibility studies). In parallel, other plans and studies are prepared for the State Government.

There are more than 20 laws applying to exploration and mining to protect the environment, Indigenous heritage, water, land, Native Title, plants and animals, biodiversity and water catchment. These need to be considered during these study stages.

After many studies are completed, and once confident there is an opportunity lying in the ground, companies will evaluate the available options and will draw up multiple plans, consider using different types of equipment and estimate the different financial implications to determine the best option.

## **Development (Detailed Design & Construction)**

– once all the regulatory, funding and technical aspects of the project have been addressed, the detail design and construction can finally begin.

The construction process can be very different depending on the mineral being mined and the size of the project.

## **Mining (Operations)**

Eventually, the project is constructed and ready to begin producing. The life-of-mine is dictated by the amount to be produced each year and the economics. This can be many years to decades.

**Mine closure** – can be because the resources and reserves have been exhausted or because they are no longer economical.

Companies are legally required to have a plan on how to close their operation before its even built.

The four Rs of mine closure:

- Remediation - cleaning up the disturbed area
- Reclamation - stabilising the terrain, topsoil replacement and landscaping to make the land useful once again.
- Restoration - rebuilding any part of the ecosystem disturbed as a result of the mine.
- Rehabilitation - returning the site to a stable and self-rejuvenating state, either as it was before the mine was built or as a new equivalent ecosystem.

### **Contact Details**

**Stakeholder Relations Manager** Lyall Grey  
T 0419 720 041 E lgrey@stavely.com.au

**Head Office** T 08 9287 7630  
E info@stavely.com.au W stavely.com.au