



Overview of Exploration Methods

Mineral exploration is undertaken in stages, with each step dependent on the results of the previous stage. Drilling is undertaken only in advanced mineral exploration and the most common drilling method is very similar to water bore drilling. This fact sheet explains the different exploration methods and equipment, how exploration is regulated, the potential impacts and how these can be managed.

What is exploration?

Exploration is the process of searching for deposits of minerals in the ground. The information gathered during exploration is used to assess the size and quality of a mineral deposit and to determine whether there is the potential for it to be mined.

All exploration and mining activity in NSW must be conducted under an authority from the NSW Government. Exploration licences contain detailed conditions to protect the environment. A substantial security deposit must also be lodged with the Government to ensure explorers satisfy licence requirements and complete rehabilitation of areas disturbed during exploration.

Can an exploration licence holder undertake mining?

Exploration licences do not permit mining, nor do they guarantee that a mining lease will be granted. Exploration does not always lead to mining. Exploration licences simply allow the licence holder to explore for minerals. Even if a licence holder discovers a mineral deposit, it may not be economic to mine at that time.

If there is the potential for a mine to be developed, any mine proposal must undergo a rigorous assessment under the *Environmental Planning and Assessment Act 1979*. This assessment process involves a series of stages that normally takes several years. Each proposal must be considered on its merits and there is no guarantee that approval will be granted.

What does exploration involve?

Exploration is initially conducted over wide areas and becomes more focused where potential mineral resources are identified. Exploration can involve a range of techniques and is generally carried out in stages. Exploration can include:

- **Collation of geological information:** Before any activities are undertaken on the ground, previous geological data is collated and analysed. This includes data from annual reports which are submitted by prior explorers to the Government, data collected by the Government, and information from surrounding areas and areas with similar geology.
- **Negotiation of access:** Before exploring on private land, exploration licence holders must reach a land access agreement with the landholder. Landholders may not veto exploration on their land, but access arrangements must be negotiated and in place before exploration may commence. The negotiations regarding access arrangements and compensation are an important part of the consultative process undertaken by the explorer.

Further information for landholders at www.resources.nsw.gov.au/landholder-information

- **Reconnaissance investigations:** Initial work on the ground usually involves a visit by a geologist to look at rock outcrops and to map the geology. It may involve vehicle access to a property, taking and recording measurements and walking across the area. It may also involve gathering small samples from rock outcrops, soils or streams for chemical analysis. Reconnaissance exploration can also include airborne surveys by low flying helicopters or light aircraft fitted with instruments flying in a grid pattern.

- Follow-up Investigations:** The reconnaissance stage may identify areas requiring further investigation. This could involve surveying the area, taking additional small soil or rock samples for analysis, geophysics surveys using electronic instruments and more detailed airborne surveys. Generally these techniques have a low impact on the surface and only involve small areas of ground disturbance.
- Detailed Investigations:** If an area of a potential mineral resource is discovered, the next stage of exploration usually involves drilling. Drilling is expensive, so the number of holes drilled to test an area of interest is kept to a minimum. The most common form of drilling is similar to water bore drilling. Explorers normally use truck-mounted drill rigs. This stage may also involve digging trenches or test pits to take a bulk sample. However, bulk sampling is not a regular occurrence (only two bulk samples were approved in NSW in 2011) and is generally only required as part of feasibility investigations for a mining proposal.



Regulation of Exploration

Exploration is regulated by the NSW Government. Every exploration licence has strict conditions including a range of environmental conditions. Additional Government approvals are required for surface disturbing activities. These approvals often need a full *Review of Environmental Factors (REF)* and *Agricultural Impact Statement (AIS)* which requires the applicant to assess the current environment in detail, justify the proposed activity and detail environmental mitigation and management methods. Bulk sampling usually requires an assessment process similar to that required for a proposed mine.



Rehabilitation of Exploration

Rehabilitation is a condition of every exploration licence and undertaken as soon as practical following surface disturbance. Planning for rehabilitation is undertaken prior to surface disturbance and in consultation with the landholder

Further information

NSW Trade & Investment – Division of Resources and Energy www.resources.nsw.gov.au

NSW Minerals Industry Exploration Handbook www.nswmining.com.au/menu/media/publications

For additional Exploration Fact Sheets, see www.nswmining.com.au/menu/media/fact-sheets

These descriptions are primarily provided for those who may not be familiar with exploration operations. As a result they are, by their nature, general. The descriptions have been written in consultation with the NSW Trade & Investment – Division of Resources and Energy. Our thanks to Malachite Resources Ltd and Golden Cross Resources Ltd for contributing photos to this fact sheet.

Disclaimer: This fact sheet is intended to provide general information only. It does not intend to be comprehensive or to provide specific legal advice. Given the changing nature of legislation, regulations, program rules and guidelines, there is a potential for inherent inaccuracies and potential omissions in information contained in this fact sheet. All information in this case study is provided 'as is' with no guarantee of completeness or accuracy and without warranty of any kind, express or implied. In no event will New South Wales Minerals Council Limited, any related members, consultants or employees thereof be liable to anyone for any decision made or action taken in reliance on the information in this paper or for any consequential damages.