Steps from mineral exploration to a mine

Developed in consultation with the WA Department of Mines and Petroleum, peak industry bodies and Western Australia native title representative bodies.
Step 1
The explorer may walk or drive and use hand tools on the land to collect small samples.

**Exploration methods that are not ground disturbing**

- **Literature search**
  Looking at history, reports and maps.

- **Geological mapping**
  Planning starts with regional and local maps, followed by new maps showing vegetation and location of rock types.

- **Geochemical sampling**
  Locating a particular mineral deposit by chemical analysis of rocks, stream sediment soils, water, gas or vegetation.

- **Geophysical exploration**
  Collecting information about the physical properties of a mineral deposit on the ground or from the air (remote sensing).
Step 2
If there is a regional standard heritage agreement, the explorer tries their best to inform native title parties of what they plan to do (the requirement to consult with native title parties or traditional owners may also be addressed in an alternative heritage agreement).

Step 3
If non-ground disturbing exploration indicates there may be minerals in the ground, the explorer informs the traditional owners or native title parties (depending on the nature of their agreement) of plans to drill holes in certain areas.

Step 4
If there is a heritage agreement, the traditional owners or native title parties decide whether a heritage survey is required.

Step 5
If a heritage survey is done the report will say where drilling cannot happen in order to protect heritage sites.

**Exploration methods that are ground disturbing**

- **Rotary air blast and aircore drilling**
  Drilling a small hole (less than 100mm) through soil and loose rock using hammer or blade bit to drill the hole. This tells the geologist if minerals are present.

- **Reverse circulation and diamond drilling**
  Drilling a deeper, larger hole (usually 140mm or larger) through undisturbed or deep rock using a hammer or blade bit or an industrial diamond impregnated bit. This tells the geologist how much mineral is present.

Drillcorp Western Deephole diamond drill rig at Mt Gibson. © Barrick Gold of Australia Ltd.
Step 6
Geologists and labs analyse samples taken from the drill exploration to see if minerals are present.

Step 7
If there are minerals present the explorer will usually drill closer spaced holes and this information is used to make:

- geological models, which help engineers estimate how much ore there is and its quality
- resource models, which help engineers estimate how much ore reserves there are
- feasibility studies, which help decide whether mining, processing and marketing the ore will be profitable.

The models and studies help make estimates and decisions about whether there will be a mine.

Step 8
If the mining company decides to start a mine, it will need to apply for a mining lease and negotiate with all registered native title claimants. Mining companies usually need to raise money before they can begin mining. This can take one to two years.

In Western Australia, Aboriginal heritage is protected by the *Aboriginal Heritage Act 1972* regardless of whether the exploration method is considered to be ground disturbing or non-ground disturbing.

Contacts

Yamatji Marlpa Aboriginal Corporation
Telephone: (08) 9268 7000
Website: www.yamatji.org.au

Goldfields Land & Sea Council
Telephone: (08) 9263 8700
Website: www.glc.com.au

South West Aboriginal Land & Sea Council
Telephone: (08) 9358 7400
Website: www.noongar.org.au

Central Desert Native Title Services
Telephone: (08) 9425 2000
Website: www.centraldesert.org.au

Kimberley Land Council
Telephone: (08) 9193 6199
Website: www.klc.org.au

Chamber of Minerals and Energy of Western Australia Inc
Telephone: (08) 9325 2955
Website: www.cmewa.com.au

Association of Mining Exploration Companies Inc
Telephone: 1300 738 184
Website: www.amec.org.au

Department of Mines and Petroleum
Telephone: (08) 9222 3333
Website: www.dmp.wa.gov.au

Commonwealth Law Courts
Level 4, 1 Victoria Avenue Perth WA 6000 GPO Box 9973 Perth WA 6848
Telephone (08) 9268 7272 Facsimile (08) 9268 7299
Freecall 1800 640 501 www.nntt.gov.au

Resolution of native title issues over land and waters.