

Production

If a resource discovered during the exploration phase is considered commercially viable, operators will begin the process to commercially extract minerals and coal.

It is important to note that many minerals and aggregates are privately owned, including numerous quarries and some iron sand projects.

Production activities normally cover a smaller area than exploration as the specific resource has to be defined in preparation of mining. The actual footprint of the mining activity is smaller again. Only a small percentage of exploration permits are progressed to mining permits and active mining operations.

Mining methods in New Zealand

Alluvial mining

Alluvial mining is a method of mining where minerals that are mixed with sand or gravels are dug up and the desired mineral physically separated out from other rock, using filtering, magnetic, or gravity separation machines. Alluvial mining can involve recreational gold-panning and suction dredging in streams or, on a larger scale, commercial land-based gold mining in river beds and on river terraces.

Open pit mining

This method of mining is mainly used for hard rock gold, iron sand, aggregate or coal mining in New Zealand. Open pit mines involve digging back the land to expose the mineral to be mined. The Martha gold mine [<http://www.waihigold.co.nz/>] in Waihi and Stockton opencast coal mine [<http://www.solidenergy.co.nz/operations/stockton-mine/>] near Westport are examples of open pit mining.

The mined material can be taken from the pit by conveyor or truck and may then be screened, crushed and treated to obtain the desired mineral. Roads or access ways need to be created so that trucks can access the pit materials. The waste material removed is generally returned to the mine site once the minerals have been taken out or stored in properly engineered impoundments, such as waste rock stacks or manmade dams (tailings dams) to contain ground waste rock.

The mine site will need to be rehabilitated to meet any land use or resource consent requirements once the mining has finished.

Underground mining

Gold, silver and coal are the minerals most commonly extracted by underground mining methods in New Zealand. The [Spring Creek coal mine](http://www.solidenergy.co.nz/operations/spring-creek-mine/) [http://www.solidenergy.co.nz/operations/spring-creek-mine/] near Greymouth and the [Correnso underground gold mine](http://www.waihigold.co.nz/) [http://www.waihigold.co.nz/] in Waihi are examples of underground mines.

To mine underground, a network of access tunnels or shafts may need to be made to reach the minerals that lay sometimes hundreds of metres below the surface of the earth. Such mining typically uses machines with cutting heads or high pressure water “blasting” to extract the mineral laden material from the ground.

Once excavated, the minerals are brought to the surface by conveyor, slurry pipeline, or specialised underground trucks, for processing and treatment.

Seabed mining

Small scale offshore sand mining is an established practice in the Kaipara Harbour and Pākiri beach. This process uses suction dredging in groundwater to extract iron sands for separation prior to exporting. This sand can then be used for construction, concrete and to replenish beaches. In New Zealand the [Taharoa iron sand mining project](http://www.nzsteel.co.nz/new-zealand-steel/the-story-of-steel/the-mining-operations/taharoa-mine-site/) [http://www.nzsteel.co.nz/new-zealand-steel/the-story-of-steel/the-mining-operations/taharoa-mine-site/] extracts sand from a pond by a floating dredge, which is then conveyed to an adjacent floating concentration plant for processing.

Two major offshore minerals projects have been granted mining permits; one to extract phosphate nodules from the Chatham Rise and the other to mine iron sands in the South Taranaki Bight. Being in the Exclusive Economic Zone (EEZ) these require a marine consent before mining activity can take place.

Seabed mining, at the scale and depth of these two projects, is new to New Zealand. The closest equivalent activity to these projects currently taking place in New Zealand, however, would be the extensive dredging of harbours and shipping lanes that takes place on a regular basis to allow for cargo and tourist shipping. These activities are typically regulated by regional councils, some of which have experience in investigating and setting environmental conditions around dredging activities.

For more information see our [Seabed mining factsheet](http://mbie17.cwp.govt.nz/our-industry/factsheets/) [http://mbie17.cwp.govt.nz/our-industry/factsheets/].

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