



# MINING



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THIS FACT-SHEET PROVIDES A BRIEF INTRODUCTION TO **MINING** CROWN-OWNED MINERALS IN NEW ZEALAND. SOME KEY POINTS ABOUT MINING METHODS AND ACTIVITIES INVOLVED IN MINING ARE OUTLINED FURTHER BELOW.

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## **AN INTRODUCTION TO MINING**

Minerals mined in New Zealand include oil and gas, gold, silver, iron ore, coal, non-metallic minerals, industrial rocks and building stones.

Mining can be undertaken in a number of different ways. Small-scale mining includes activities such as gold panning (undertaken by ‘hobby miners’), beach sand gold mining and suction dredging. Large-scale mining includes opencast or underground operations used for the commercial extraction of minerals. Mining operations can use different methods and equipment depending on the mineral being mined and its physical location in land. The mining of petroleum and some minerals can occur offshore through the use of production platforms or dredging.

Before mining takes place, mineral developers will usually have done prospecting and exploration in the area to accurately delineate the mineral deposit or petroleum field. Sometimes records of prospecting and exploration work in an area already exist and are used. In addition, the Government has invested in acquiring seismic data to assist and encourage further petroleum exploration in specific petroleum basins.

FOR FURTHER INFORMATION ON THE KIND OF ACTIVITIES THAT MIGHT BE DONE BEFORE MINING TAKES PLACE, SEE FACT-SHEET:

- + **Prospecting and Exploration**

## **MINING PERMITS**

In order to mine Crown-owned and administered minerals, a person first needs to be granted a mining permit by the Government.

A mining permit:

- + allows a permit holder to mine Crown-owned and administered minerals; and
- + can be granted for up to 40 years

Permits do not give a property right over land or an automatic right of access to land. To mine, any necessary land access arrangements and resource consents must also be obtained under the Resource Management Act 1991 (RMA).

FOR FURTHER INFORMATION SEE FACT-SHEET:

- + **Permits and Land Access**

# MINING METHODS

## 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 gravitational processes such as with a trommel and screen (filtering 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, ironsand 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 in Waihi and Stockton opencast coal 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 mineral wanted. 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 tailings dams. The mine site will need to be rehabilitated to meet any land use or resource consent requirements once the mining has finished.

## UNDERGROUND MINING

Coal and gold are minerals extracted by underground mining methods in New Zealand. The Spring Creek coal mine near Greymouth and the Favona underground gold mine 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 lie below the ground's surface. Such mining often uses machines with cutting heads or high pressure water monitors 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.

## PETROLEUM DEVELOPMENT

The Taranaki region is currently home to all of New Zealand's oil and gas producing operations. Oil and gas is extracted from the ground by way of a production bore(s) that is drilled by an oil rig into the subsurface reservoir horizon. A steel pipe (casing) is placed in the hole, to provide structural integrity to the newly drilled wellbore. Holes are then made in the base of the well to enable oil and gas to pass into the bore. Finally a collection of valves are fitted to the top to regulate pressure and control flows.

Production facilities and related infrastructure are built to process the oil and gas, either onshore, as in the case of the Kapuni field gas-condensate production station, or offshore, as in the case of the Tui oil field.

New Zealand's offshore petroleum operations utilise permanent platforms, such as the Maui gas-condensate field, where produced oil and gas go through product separation on the platform and are then piped onshore where they are treated to create a petroleum product ready for market.

## GOVERNMENT FISCAL RETURN

The Government receives revenue from mining operations in the form of a combination of royalties, levies and taxation.

The royalty regime comprises a combination of:

- + specific rate royalty for bulk high volume, lower value minerals, such as aggregates, limestone and coal
- + ad valorem royalty (a specified percentage of net sales revenues from a permit) for high value minerals such as gold and silver
- + a hybrid ad valorem and accounting profit royalty, whichever is calculated to be the higher, for oil and gas.

Further, all opencast coal miners, and some gas producers, are also subject to an Energy Resources Levy based on a specified price per unit of production.

The revenue for Government in the 2009/2010 year from mining royalties and Energy Resource Levy payments was over \$450 million.

In addition, there is considerable revenue to the Government through personal and company taxation from mining activity.



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General disclaimer: The Ministry of Economic Development, in providing advice on the Crown Minerals Act 1991, is not to be taken as defining or providing a definite interpretation of the Act. Questions of interpretation are matters for the Courts to decide. Any advice given is intended as a general guide only and you are advised to carefully consider the express provisions of the Act itself. In the event of uncertainty in interpretation, it is advised that independent legal advice is sought.