

# METALLIC MINERAL OCCURRENCES

## ▶ Aluminium

Bauxite deposits in Northland are regarded as subeconomic in both size and grade.

## ▶ Antimony

Stibnite has been recorded from many localities, mainly in association with mesothermal gold-bearing quartz lodes in Paleozoic and Mesozoic greywacke and schist. About 3900 t of antimony ore has been mined in the past. Further production could be as a byproduct of gold mining. There is no current mining or exploration.

## ▶ Beryllium

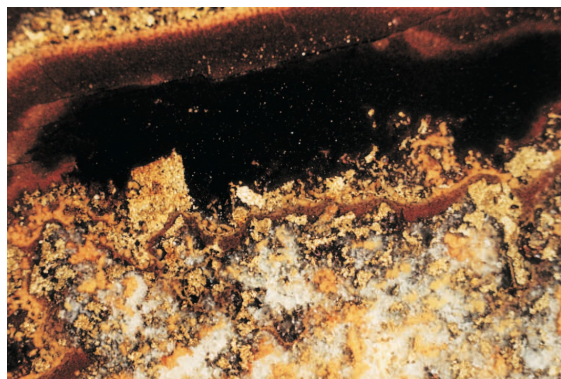
Beryl occurs in pegmatites near Charleston on the West Coast and at Paterson Inlet, Stewart Island.

## ▶ Chromium

About 6000 t of chromite was mined up to 1902 from the Dun Mountain Ophiolite Belt in eastern Nelson. Potential for further deposits is limited.

## ▶ Copper

A wide variety of small copper deposits in New Zealand represents most of the major types found elsewhere in the world. About 7500 t of copper ore has been mined in New Zealand, but there is little incentive for further exploration because of the large number of low-cost copper mines and undeveloped deposits overseas.



Hematite and chalcopyrite, Tui mine

## ▶ Gallium

Gallium is present in muds and sinters of geothermal fields of the Taupo Volcanic Zone.

## ▶ Gold

Gold deposits in New Zealand are in mesothermal quartz lodes in Paleozoic metagreywacke and Mesozoic schist, epithermal quartz lodes in Cenozoic volcanic rocks, and placers in Cenozoic gravel and sand.

New Zealand's officially recorded production of gold to date is just over 1000 t. Current annual production of about 9 t comes from the large hard-rock mines at Macraes Flat

and Waihi, several medium sized alluvial operations, and a large number of small alluvial mines. Significant gold resources have been identified in recent years, and exploration is expected to continue in the Hauraki Goldfield, Northland, the Taupo Volcanic Zone, Westland and Otago.



Epithermal gold

### ► Iron

The main type of iron ore deposits in New Zealand are which extend along 480 km of coastline from Kaipara Harbour south to Wanganui on the west coast of the North Island. Deposits at Waikato North Head and Taharoa are currently mined. Ironsand from the Waikato North Head is used for steel-making at BHP New Zealand Steel's Glenbrook mill, which uses about 1.2 Mt of concentrate per year. About 1.4 Mt per year of titanomagnetite concentrate from Taharoa is exported.

### ► Lead

Most known lead-zinc deposits in New Zealand are in hydrothermal veins commonly associated with gold and silver. The best prospects for large lead-zinc deposits are in Fiordland and Northwest Nelson, but not only is access to these mountainous areas difficult, they are largely within the Fiordland and Kahurangi national parks. The only mineral deposit mined in New Zealand primarily for lead and zinc was the small Tui Mine near Te Aroha. There is no current mining or exploration.

### ► Lithium

Lithium is present in brines found in the geothermal fields of the Taupo Volcanic Zone.

### ► Manganese

Manganese deposits are widespread but small. Manganese has been mined in the past, but there is little prospect of further economic deposits on land. New Zealand has an extensive sea floor resource of manganese nodules within its EEZ.

### ► Mercury

The main mercury deposits are associated with extinct and active hot springs in Northland and Coromandel. 76.5 t of mercury was produced from the 1890s to 1945. Small resources are known at several localities. There is no current mining or exploration.

### ► Molybdenum

The main molybdenum deposits are in Northwest Nelson. Their exploration was abandoned in 1981 due to low prices, and further exploration is deterred by their location in the Kahurangi National Park. There is no current mining or exploration.



Molybdenite

### ► Magnesium

Magnesite is present with talc in ultramafic rocks in Northwest Nelson, Westland, north Otago and Southland. The Cobb-Upper Takaka district has been a small producer of talc-magnesite for agriculture and industry, but production ceased in 1981. There is no current mining or exploration.

## ► Nickel

The main occurrence of nickel in New Zealand is nickel-copper sulphide mineralisation associated with the Riwaka Igneous Complex mafic-ultramafic rocks in Northwest Nelson. Drilling has indicated that the deposits are too small to be primary nickel sources, but there is potential for byproduct nickel mining if significant PGM deposits are found.

## ► Platinum group metals (PGM)

PGM are common in New Zealand and are usually associated with chromite in basic to ultrabasic complexes, or as alluvial concentrations. PGM-bearing sediments extend for 30 km south of the Longwood Range and for about 100 km eastward along the beaches of Southland.

The source of detrital PGM in Southland is the basic and ultrabasic rocks in the Longwood Range north of Orepuki, at Pahia Point to the south, and at Bluff. There are similar rocks in the Anglem Complex on Stewart Island. Comparisons have been made with highly productive layered igneous complexes overseas.

PGMs are also associated with chromite in the Red Hill mineral belt north of Fiordland and the Dun Mountain mineral belt in eastern Marlborough. Near Nelson, PGMs are associated with sulphide mineralisation in a 30 km-long Riwaka basic to ultrabasic intrusive complex.



Alluvial platinum from Western Southland

## ► Rare-Earth Elements (REE)

Rare-earth elements are the 15 lanthanide elements with atomic numbers 57 to 71 of the Periodic Table. Scandium and thorium are commonly included with the REE because of their similar properties. There is no recorded commercial New Zealand production of REE. Coastal ilmenite deposits near Westport and Barrytown contain minor amounts of monazite which could be recovered as a byproduct of ilmenite and gold production.

## ► Silver

The most significant occurrences of silver are in the Hauraki Goldfield, where silver is an important byproduct of gold mining. The total amount of silver recovered here to the end of 1995 is estimated at 1256 t. There are several silver mineralisation localities in other parts of New Zealand.

## ► Tin

The main occurrences of tin are in Stewart Island and Westland. About a tonne of alluvial tin concentrate was produced from Stewart Island near the end of the 19th century. There are no identified resources in New Zealand.

## ► Titanium

Ilmenite-rich black sands, with locally economic concentrations of gold, are present at intervals along 320 km of the west coast of the South Island. The largest deposits are at Barrytown (6.9 Mt of ilmenite) and near Westport (5.5 Mt of ilmenite). The very large resources of titanomagnetite in the west coast North Island ironsands contain 7–8% TiO<sub>2</sub>. Ilmenite beach sand deposits are also present on the east coast of the Coromandel Peninsula in the North Island.

## ► Tungsten

The most significant occurrences are in schist-hosted quartz-scheelite lodes, which may be gold bearing, in Otago and Marlborough. Although about 1000 t of scheelite was produced from the Macraes deposit up until 1936, scheelite is not worth recovering from the present gold mining operation at current prices.

## ► Uranium

The main occurrences of uranium in New Zealand are sandstone-type uranium deposits in the lower Buller Gorge and the Pororari River areas, although detrital uraninite has been recorded in gold dredge concentrates at Taramakau River and Gillespies Beach in Westland, and prospecting has identified some radioactive dikes and granites in west Nelson and Fiordland.

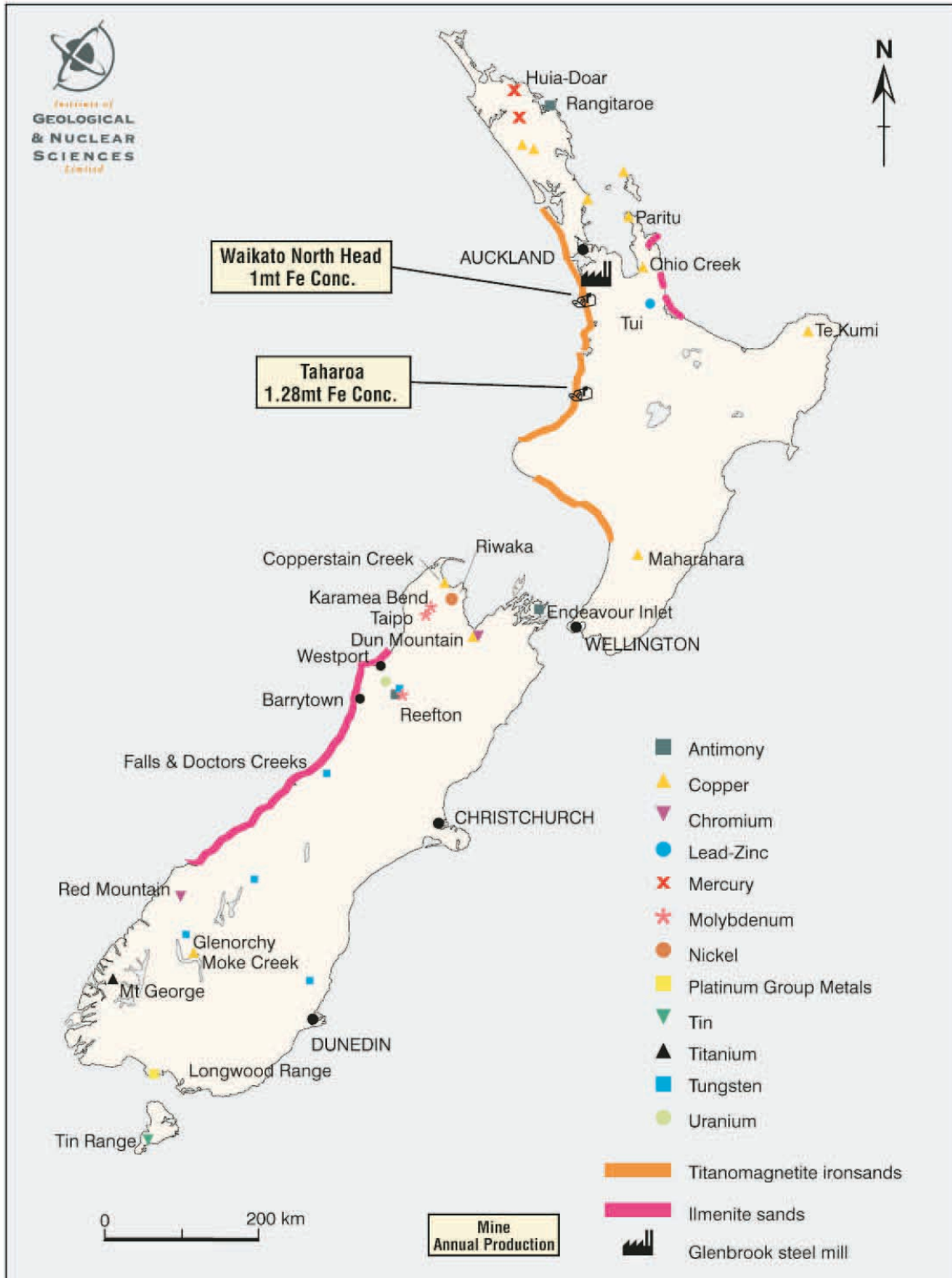
There has been no recorded commercial production of uranium from New Zealand deposits and there will be no production in the near future due to New Zealand's nuclear free legislation and the Minerals Programme for Minerals other than Coal and Petroleum which specifically does not allow prospecting, exploration and mining of the primary uranium and thorium minerals.

## ► Zinc

Most lead-zinc deposits known in New Zealand are in hydrothermal veins commonly associated with gold and silver. The best prospects for large lead-zinc deposits are in Fiordland and Northwest Nelson, but not only is access to these mountainous areas difficult, they are largely within the Fiordland and Kahurangi national parks. The only New Zealand mineral deposit mined primarily for lead and zinc was the small Tui Mine near Te Aroha, which closed in 1974. There is no current mining or exploration.

## ► Zirconium

Zircon is widely distributed as an accessory detrital mineral in titanomagnetite and ilmenite beach sand deposits of the North and South islands.



New Zealand Metallic Minerals