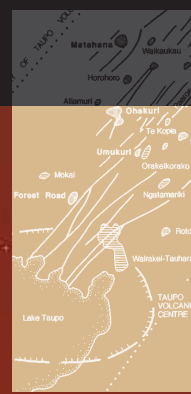




Explore New Zealand Gold





Macraes Mine/GRD Macraes

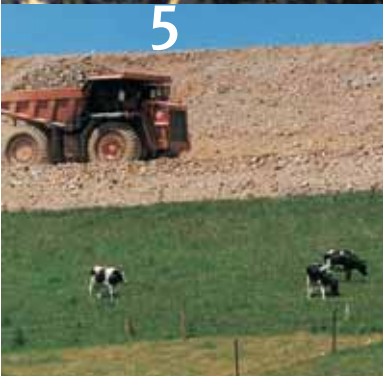
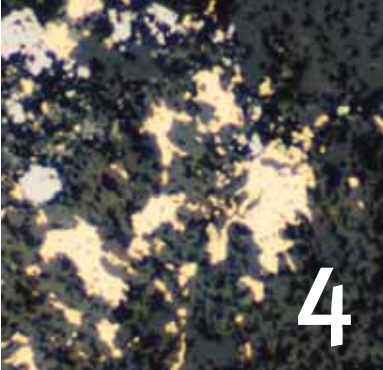
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Explore New Zealand Gold

SIX COMPELLING REASONS FOR GOLD COMPANIES TO EXPLORE NEW ZEALAND

- 1 World-class core gold assets**
 - Martha and Macraes gold mines currently producing 300,000 ounces pa
 - 19 million ounces historical alluvial production
 - 13 million ounces historical hard rock production
- 2 Quality world-class exploration ground**
 - 19,000 sq km of epithermal gold opportunities
 - 40,000 sq km of mesothermal gold opportunities
 - Recent success in all prospective environments
- 3 Skilled explorationists, developers and operators**
- 4 World-class reputation for research and innovation**
 - Leaders in geothermal/epithermal research
 - World-first mechanised gold dredge
 - World-first commercial cyanide extraction
- 5 Highest standards of environmental management**
 - World-leading environmental practise in existing mines
 - Platform of low risk for companies embracing high standards of compliance
- 6 Open economy and fiscal regime**
 - Transparent regulatory environment
 - Open and efficient financial and taxation systems

geology

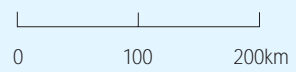
GOLD PROVINCES AND GOLD DEPOSITS



Legend

- Gold deposits
- Epithermal gold province
- Mesozoic mesothermal gold province
- Paleozoic mesothermal gold province

Scale





INTRODUCING WORLD-CLASS EPITHERMAL AND MESOTHERMAL **gold** OPPORTUNITIES IN NEW ZEALAND

Technical descriptions, data and prospectivity modelling are presented on three interactive CDs produced by Crown Minerals. A general reference on New Zealand's mineral resources supports regional scale prospectivity modelling CDs on mesothermal and epithermal gold opportunities.



1

An introduction to New Zealand's mineral resources



2

Mesothermal gold in New Zealand: GIS data package and prospectivity modelling



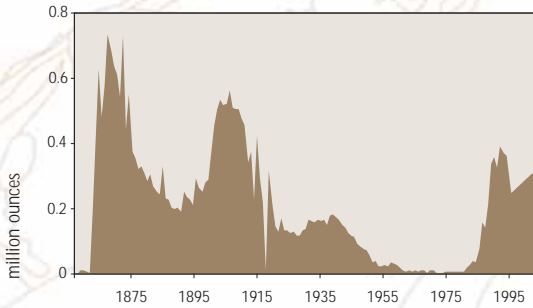
3

Epithermal gold in New Zealand: GIS data package and prospectivity modelling

For free copies of the technical CDs or further information, contact:

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NZ gold output, 1857 to 2003

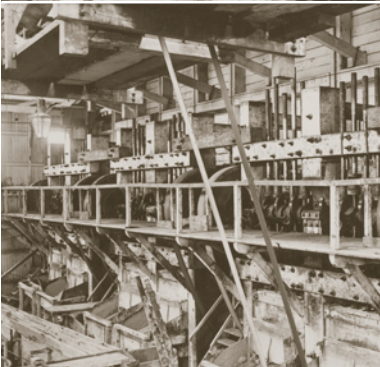
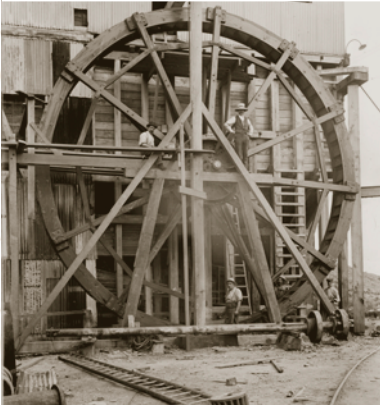


Gold dredge, Clutha River/Archives New Zealand

Historically **GOLD CONTRIBUTED SIGNIFICANTLY TO THE DEVELOPMENT OF NEW ZEALAND**

The early settlement and development of New Zealand was financed through gold mining. Historical production was 19 million ounces of alluvial and 13 million ounces of hard-rock gold, and world-class gold assets continue to contribute to the economy.

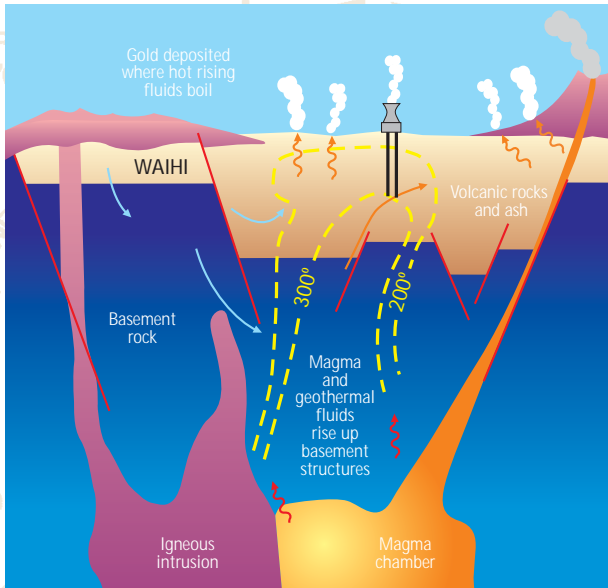
The Martha gold mine in the Coromandel and the Macraes gold mine in Otago are world-class gold deposits, with combined annual production of over 280,000 ounces of gold. Both mines have been operating for over ten years and have the resources to support continued low-cost operations. New gold mining projects include Favona, Frasers and Blackwater underground mines, and the Globe-Progress open-cut mine.



- Following the first reports of gold near Coromandel in the 1830s, a series of gold rushes contributed significantly to the early development of New Zealand, with a recorded production of over 32 million ounces of gold since the 1850s.
- Alluvial mining in the Otago and West Coast regions contributed to a record annual production of 735,000 ounces of gold in 1866. Gold pans and sluice boxes were replaced by hydraulic mining, in turn leading to the development of mechanised gold dredges.
- The world's first commercially successful gold dredge was the *Dunedin*, which continued to operate in the Clutha River until 1901, by which time it had recovered 17,000 ounces of gold. More than 200 gold dredges operated in Otago and Southland between the 1890s and 1915. Gold dredges continue to operate today, with the massive Grey River dredge in Westland processing nearly 5 million cubic metres of gravel a year.
- The Waiuta mine in the Reefton goldfield produced 2.2 million ounces of gold between 1870 and 1951. Renewed interest in this Mesozoic hard-rock goldfield with the proposed development of the 1 million ounce Globe Progress deposit demonstrates the potential for additional world-class gold deposits in the area.
- The Martha mine in the Hauraki goldfield produced 5 million ounces of gold and 11 million ounces of silver between 1880 and 1951. The hard-rock deposit has been open-pit mined since 1987, and there has been successful new exploration in the area.

Epithermal

GOLD OPPORTUNITIES



Over 19,000 sq kms of Tertiary volcanics are prospective for epithermal gold mineralisation. Where exposed in the Hauraki goldfield, over 50 gold deposits have been exploited, and the recent Favona gold discovery adjacent to Martha attests to significant remaining discovery potential.

More than 75% of the prospective area remains unexplored beneath a blanket of volcanic ash in the Taupo Volcanic Zone. Ten gold prospects in the zone's ancient geothermal fields demonstrate the potential for additional world-class epithermal gold deposits.

New Zealand scientists were the first to recognise the shared characteristics of geothermal systems and epithermal gold deposits, leading to a geological model of epithermal gold deposits.

KEY GEOLOGICAL CRITERIA

Primary characteristics

- A magmatic arc rift setting on a convergent plate boundary
- Localised on the margins of active or extinct caldera features
- Deposits associated with active or extinct geothermal areas previously known for mercury or siliceous sinter deposits.

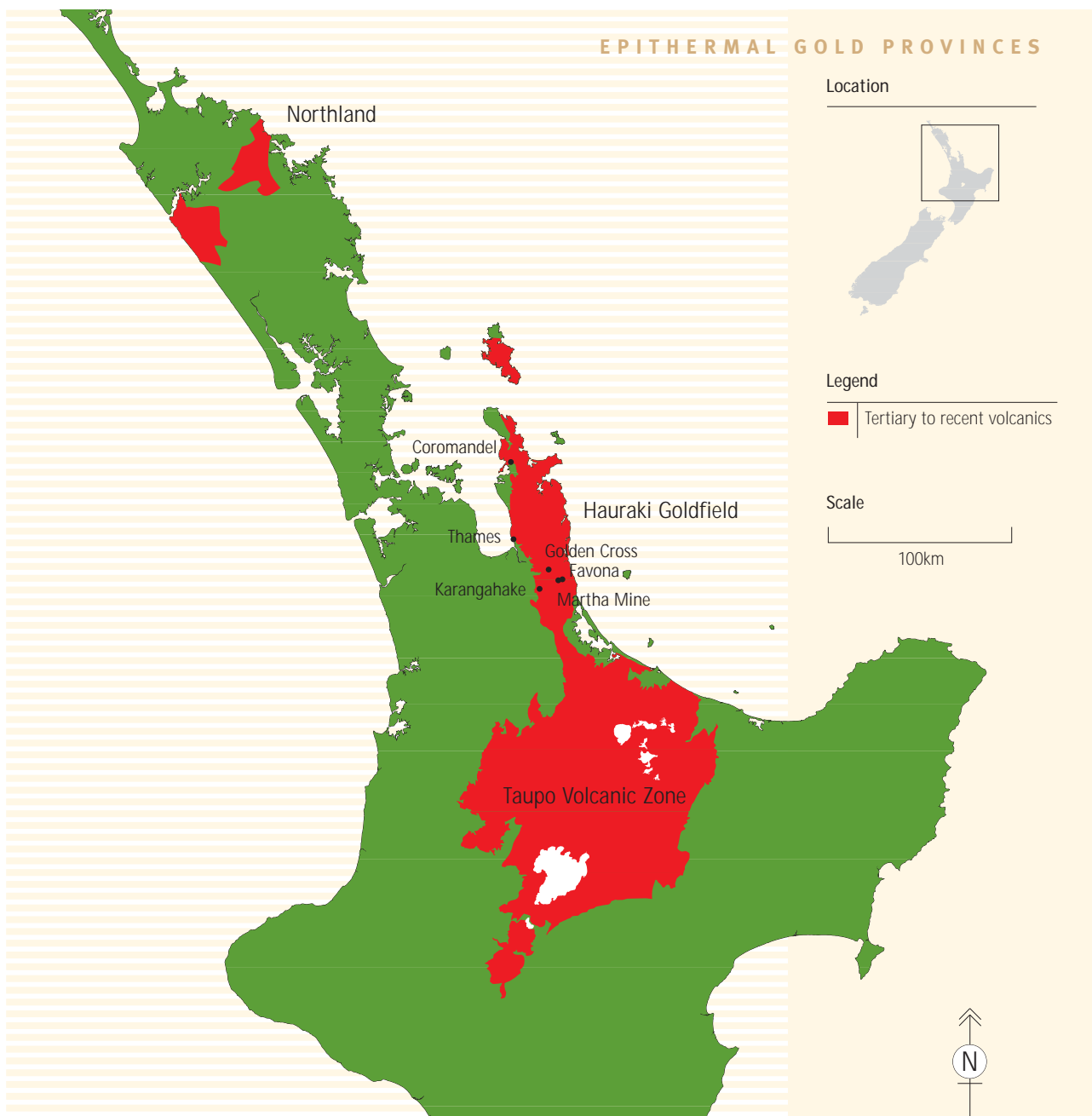
Deposit features

- Hosts: andesitic to rhyolitic flows, flow breccias and pyroclastics
- Structure: steep to moderately dipping extensional quartz veins
- Mineralogy: electrum, acanthite, pyrrargyrite, accessory galena, sphalerite and chalcopryrite
- Mineral host: quartz with ubiquitous pyrite, calcite and lesser adularia, rhodochrosite, siderite, barite, anhydrite and inesite
- Alteration: elongate mineral envelopes of chlorite-calcite-quartz, pyrite, ± illite, adularia, albite, and epidote grade to intense pervasive silicification with quartz, illite, adularia and pyrite.

Deposit analogues

Waihi	NZ	10 m oz
Lihir	PNG	37 m oz
Emperor	Fiji	10 m oz
McLaughlin	USA	40 m oz
Hishikari	Japan	9 m oz
Golden Cross	NZ	0.75 m oz
Karangahake	NZ	1 m oz
Favona	new find/NZ	possibly 1 m oz





NEW ZEALAND HOSTS THE WORLD-CLASS

Martha

EPITHERMAL GOLD DEPOSIT



Lying at the southern boundary of the Hauraki goldfield and partially mantled by younger volcanics, the Newmont-owned Martha mine suggests that there are enormous opportunities in its vicinity and to the south where cover has denied conventional exploration approaches. The Martha mine has more than 10 million ounces of gold in historic production and resources and is currently producing over 100,000 ounces of gold a year. Production from the Martha mine has decreased in recent years. The Favona development is expected to make up the short-fall of the pit production. Probable resources estimated for Favona are 1.1mt @ 10g/t.

MESOTHERMAL GOLD PROVINCES

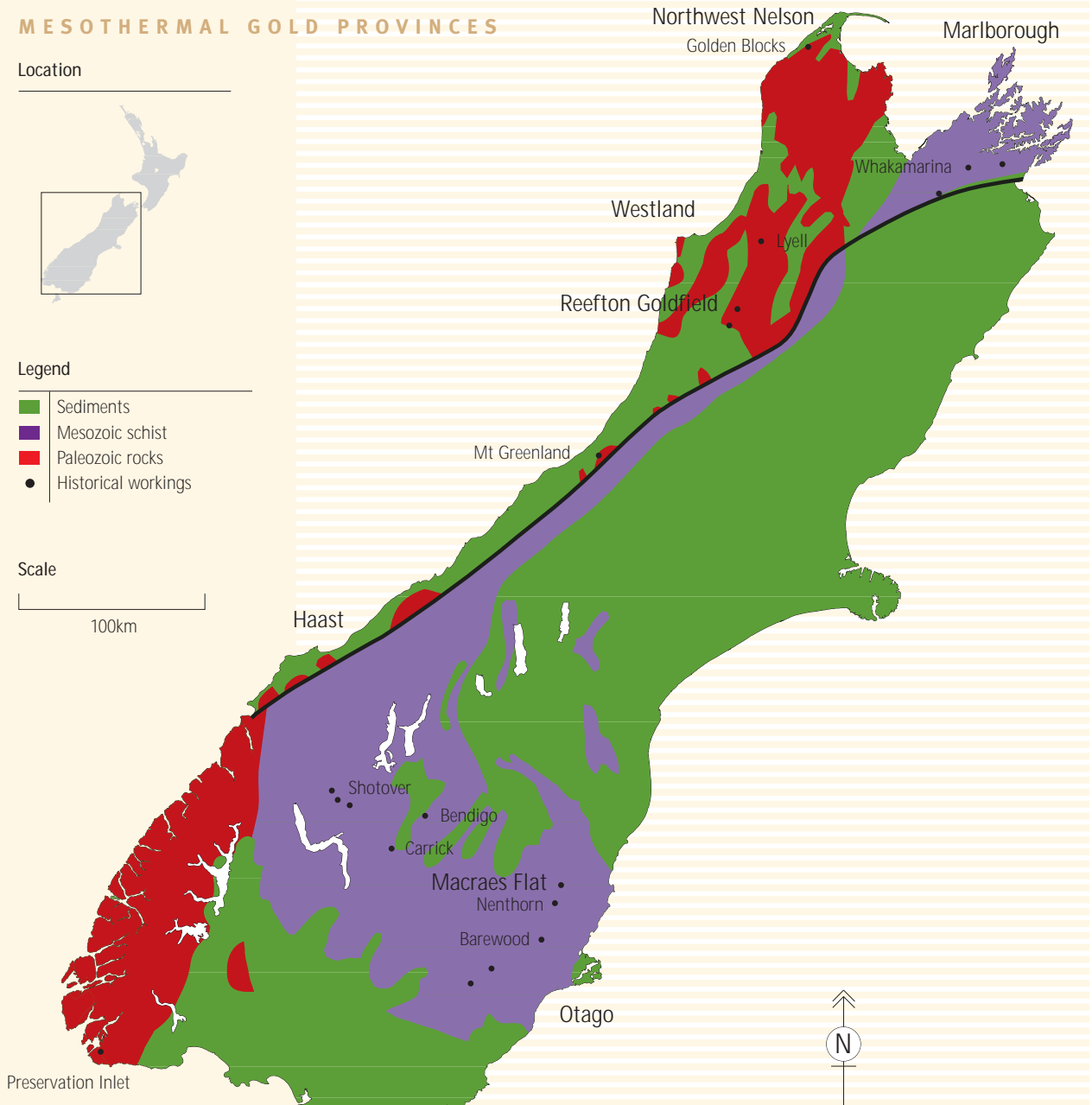
Location



Legend

- Sediments
- Mesozoic schist
- Paleozoic rocks
- Historical workings

Scale



NEW ZEALAND HOSTS THE WORLD-CLASS

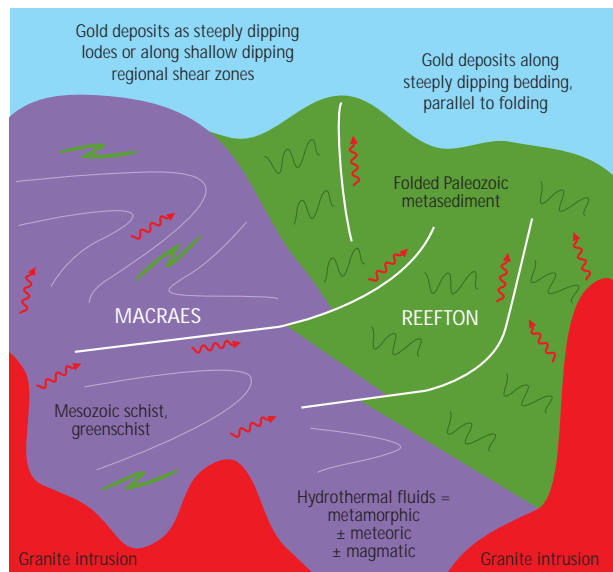
Macraes MESOTHERMAL GOLD DEPOSIT



The GRD Macraes gold mine in Otago has been New Zealand's largest gold producer for the last decade and continues to demonstrate long life and low costs. Global resources are over 5 million ounces, from which the mine is producing around 170,000 ounces a year from a series of pits along the gently dipping, 26 km-long Hyde-Macraes Shear Zone. It is anticipated that the Macraes underground mine will increase the gold output in the future.

Mesothermal

GOLD OPPORTUNITIES



The historic Waiuta mine and the newly developing Globe-Progress deposit, both in the Reefton goldfield, typify the potential for world-class Paleozoic mesothermal gold deposits. With historic production and current resources in excess of 4 million ounces, these gold deposits demonstrate the scope for major exploration opportunities. Host rocks are metagreywackes, with gold mineralisation in quartz lodes and stockworks localised at the intersections of bedding and folding with structure.

Host rocks for the Mesozoic mesothermal gold deposits are turbidite schists, with gold localised along single or multiple parallel shear zones that generally dip steeply.

New prospectivity mapping has revealed significant unexplored potential for both Paleozoic and Mesozoic mesothermal gold deposits in the 40,000+ sq km of prospective rocks. A prospectivity compilation on CD presents GIS deliverable datasets providing the most up to date and comprehensive geoscientific information available on a national scale.

Modelling using spatial pattern recognition techniques indicates significant potential for the discovery of new gold deposits in three areas:

- Potential for additional high-grade Paleozoic gold discoveries in the Reefton region
- Favourable and unexplored prospective Mesozoic gold districts in the Marlborough region
- Potential for new world-class Mesozoic gold discoveries in the Otago and Haast regions

KEY GEOLOGICAL CRITERIA

Structural controls

- Gold is located in laterally extensive shear zones
- Quartz vein length and vein density are characteristic
- Different vein deposits in a specific goldfield generally have the same strike
- Presence of northeast striking veins in Otago and northwest striking veins in Marlborough may be indicative of shear zone deposits

Lithological controls

- Deposits localised by lithology, at intersections of bedding and folding with structure
- Deposits favour greenschist facies and low-grade metamorphic facies, argillite-rich facies are important in Paleozoic deposits

Geochemistry

- Gold \pm arsenic, minor antimony and tungsten



Rob Suisted

WORLD-CLASS REPUTATION FOR RESEARCH AND

innovation

Because of its geographic isolation, New Zealanders have developed an enviable “can do” reputation for innovation and ingenuity.

Leaders in epithermal gold deposit studies

Insights gained during exploration for geothermal energy resources in New Zealand has led to major advancements in the understanding of epithermal gold deposits. The discovery of precious metal deposits in geothermal wells has led to new models for gold deposition, which show that there is sufficient fluid flux to enable epithermal gold deposits to form in relatively short periods of geological time.

Geothermal wells enable the study of the chemical anatomy of geothermal systems and associated hydrothermal alteration.

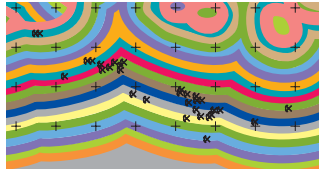
Leaders in geothermal development

Geothermal energy exploration in New Zealand commenced in 1950, and by 1963, the Wairakei geothermal power station near Taupo was fully operational. New technologies for geophysical exploration, drilling deep wells, and development of fluid-rich geothermal resources, were developed during this period. The Wairakei plant continues to operate today, and New Zealand's expertise in geothermal exploration and development has been applied world-wide.

Leaders in gold processing

The first commercial use of the cyanide process was in New Zealand at the Crown Battery at Karangahake in 1889. Gold and silver recovery were almost doubled. This success led to a major expansion of the nearby Martha mine, and by the time the mine closed in 1952 it had produced about 5 million ounces of gold and 35 million ounces of silver from nearly 11 million tonnes of ore. More recently, the first commercial use of recycled cyanide occurred at the Golden Cross mine in 1991, and GRD Macraes have improved gold recovery with continuous refinement of the pressure oxidation process.





Skilled

EXPLORATIONISTS, DEVELOPERS AND OPERATORS

Key to any successful operation is a team of highly skilled employees. New Zealand has an enviable record in education, with an international reputation for exemplary resource graduates filling leading roles in many international companies. In New Zealand this leaves a legacy of high quality institutions, and a pool of international standard research scientists, explorationists, developers, and operators.



Engineering workshops, analytical facilities, raw materials and chemical supplies are readily available with a high quality roading and transport infrastructure supporting New Zealand's agriculture-based economy.

Explorationists

New Zealand's explorationists are highly respected geoscientists, often with wide international experience. Crown Minerals maintains an extensive library of past exploration results, and this data is available in modern digital form for rapid assessment by GIS methods.

Developers

Developers work closely with land owners, local residents, tangata whenua and regional and local authorities to promote projects that contribute to economic, social and environmental goals described in the framework of the Resource Management Act. Central and local government assist by providing state-of-the-art land information systems.

Operators

Major gold mine operators in New Zealand are proud of their record for low-cost operations within a strict environmental management framework. Modern processing technologies allow for highly efficient extraction of gold. Site rehabilitation planning draws on New Zealand's extensive expertise in soil science, agriculture and horticulture, resulting in enhanced land values after mining operations have ceased.



Open economy

BUSINESS ENVIRONMENT AND FISCAL REGIME



Rob Suisted

New Zealand has a long standing record for its stable and open political and socio-economic systems and for its free commercial environment. With an internationally competitive economy, low inflation and high business honesty, New Zealand is a low risk place to invest.

Any company wishing to explore or develop mineral resources must obtain a permit under the Crown Minerals Act 1991. Permits confer exclusive rights to the permit holder, but not the right of access to land.

Land access rights are negotiated directly by the permit holder and the landholders and occupiers. Resource consents are required for all activities involving effects on the environment. These are controlled by District Councils under the Resource Management Act.

Highest STANDARDS OF ENVIRONMENTAL MANAGEMENT



New Zealand leads the world in environmental and sustainability issues through its Resource Management Act, providing a platform of low risk to global operators who embrace the highest standards of compliance.

At Waihi, the Martha mine operates within a township of 6,000 people. This attests to the careful management and environmentally sensitive policies of the mining company.

Tailings dam engineering, bund rehabilitation and waste management at Waihi successfully demonstrate safe environmental practice and return of land after mining operations to rural economic viability.

At Reefton, GRD Macraes successfully negotiated access to mine a 170 hectare area inside Department of Conservation land in the Victoria Forest Park for the company's Globe-Progress mine.

PAST,
PRESENT & future



Hauraki goldfield, 1896/Alexander Turnbull Library



Macraes mine/Tony Christie



Black smoker/GNS

