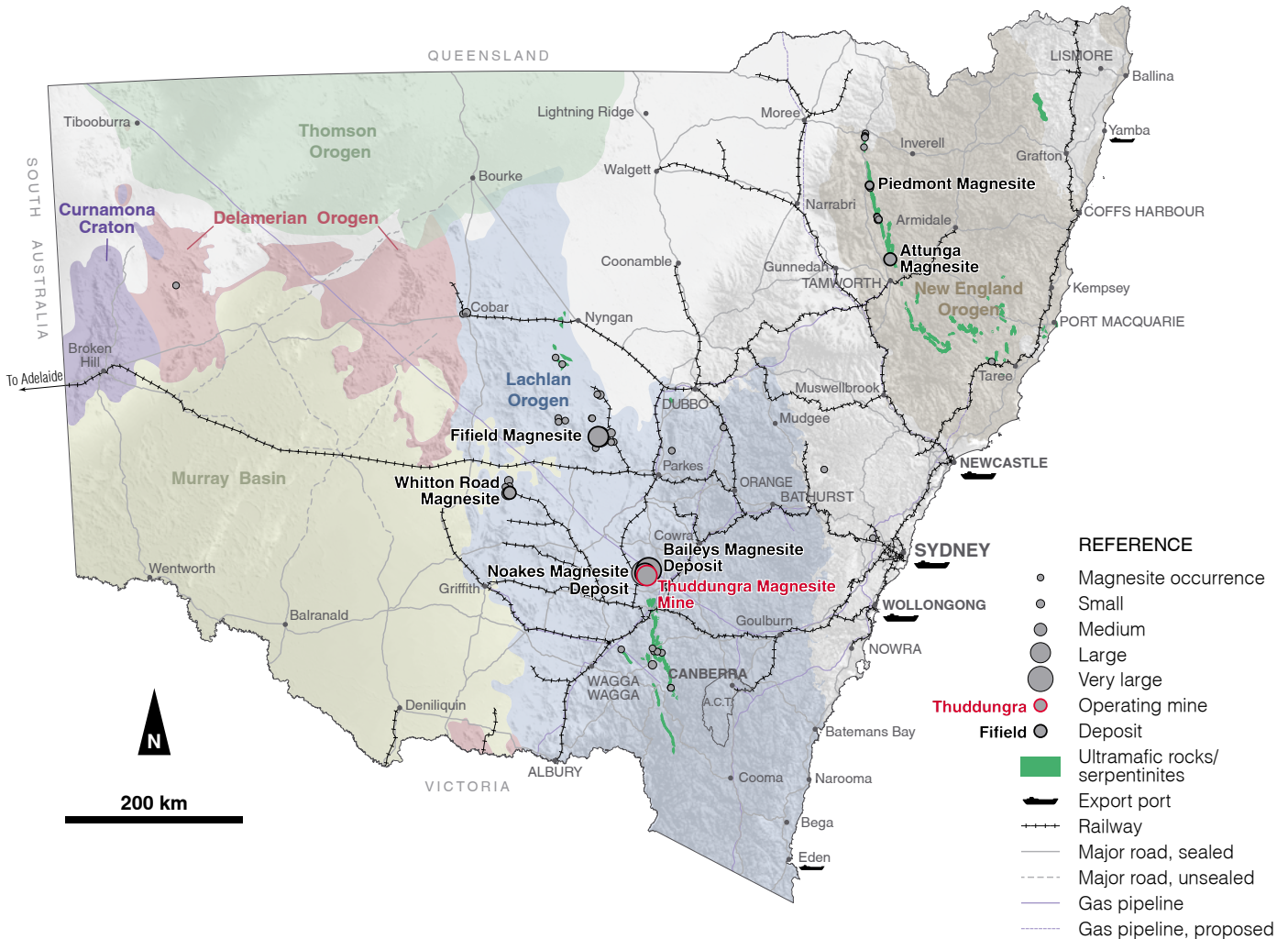


Magnesite

Opportunities in New South Wales, Australia



OCTOBER 2014



Overview

- New South Wales hosts large, ultrapure, cryptocrystalline and nodular deposits, as well as widespread regolith-hosted replacement deposits.
- Boutique opportunities exist for agricultural and specialist applications.
- World magnesite supply has been impacted by modernisation in China reducing its export capacity. Western nations are seeking other suppliers, so there is strong demand from local and international markets.

Geological setting

Magnesite ($MgCO_3$) is rhombohedral (47.8% MgO and 52.2% CO_2 when pure) and occurs as a solid solution with siderite ($FeCO_3$).

Deposits in New South Wales are typically:

- ultrafine-grained (crypto- to micro-crystalline or 'bone')
- coarse-grained 'sparry'

Development opportunities

- Large, high-grade colluvial channel-hosted deposits (e.g. Thuddungra and nearby Noakes, Baileys Magnesite deposit etc.)
- Weathered ultramafic intrusions (e.g. Fifiel)
- Nepheline olivine basalts and leucitites (Cargelligo deposits, e.g. Whitton Road)
- Vein-style silica-carbonate deposits (Piedmont and Attunga)

Exploration opportunities

- Clarence–Moreton Basin: Sedimentary deposits may occur near the Gordonbrook Serpentinite
- Great Serpentinite Belt: smaller vein-style (Krubath-type) are widespread
- Delamerian Orogen: Potential for large, sparry deposits



Project highlights

Thuddungra Magnesite mine: (measured resource) 3.8 Mt @ 55.1% $MgCO_3$. Currently produces 30 000 tpa (-12% of national supply). The ore is cryptocrystalline and nodular, of exceptional quality (>99.8% $MgCO_3$) and suitable for refractories and pharmaceuticals. It includes lower-grade bulk material suitable for a wide range of applications.

Additional ore occurs at the nearby Noakes and Baileys Magnesite deposits.

Noakes: (measured resource) 12.6 Mt @ 43.0% $MgCO_3$.

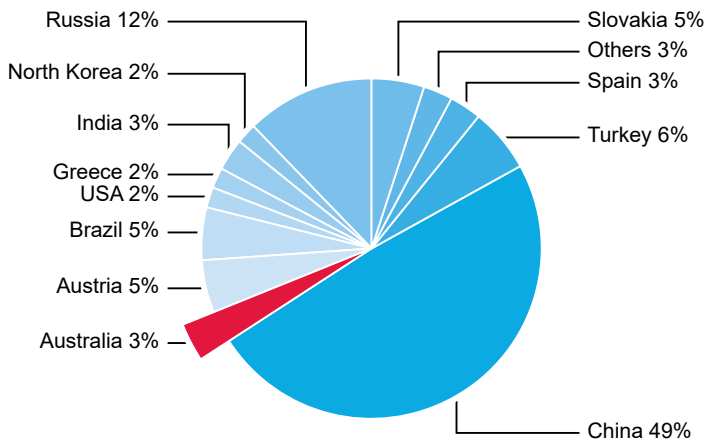
Fifield Magnesite mine produced ~895 000 tonnes hard magnesite (99.19% MgO calcined).

The nearby BHP Magnesite mine produced ~1 Mt of magnesite.

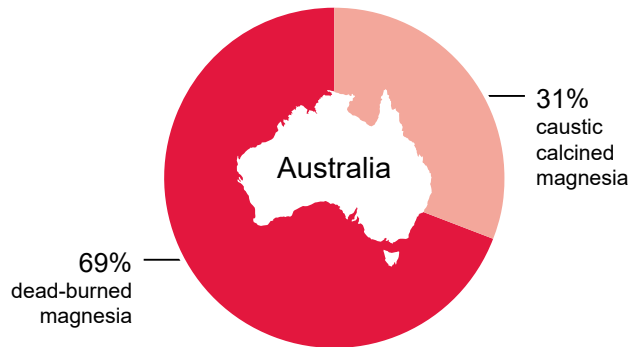
Cincinatti mine has existing mine infrastructure.

Cargelligo (Whitton Road deposits) has numerous deposits of 93.4–97.3% $MgCO_3$ with ferric oxide from 0.5–1.8%.

World magnesia production (from magnesite) by country

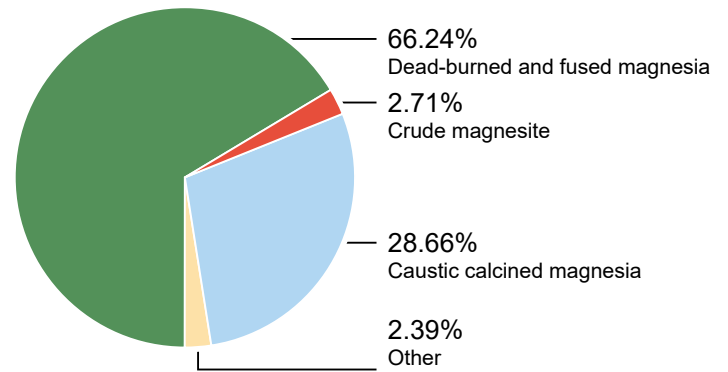


Total resources in Australia = 330 Mt



Source: <http://www.indmin.com/magnesia.html>

Magnesite end products – totalled 582 700 t (USA, 2008)

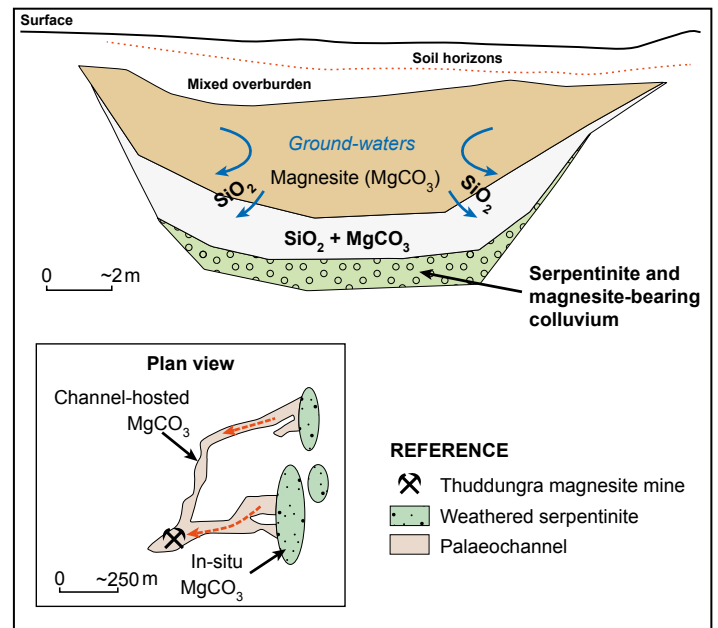


Dead-burned and fused magnesia: 386 000 t
Refractories (including steel and metallurgical industries)
Cement
Glass

Caustic calcined magnesia: 167 000 t
Cements for flooring, wallboards and mouldings
Acoustic tiles
Various environmental and chemical applications

Crude magnesite ($MgCO_3$): 15 800 t
Chemicals
Agriculture
Pharmaceuticals

Source: <http://minerals.usgs.gov/minerals/pubs/commodity/magnesium>



Cross-section of palaeochannel fill in the Thuddungra district (diagrammatic only).

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