Gypsum

Opportunities in New South Wales, Australia

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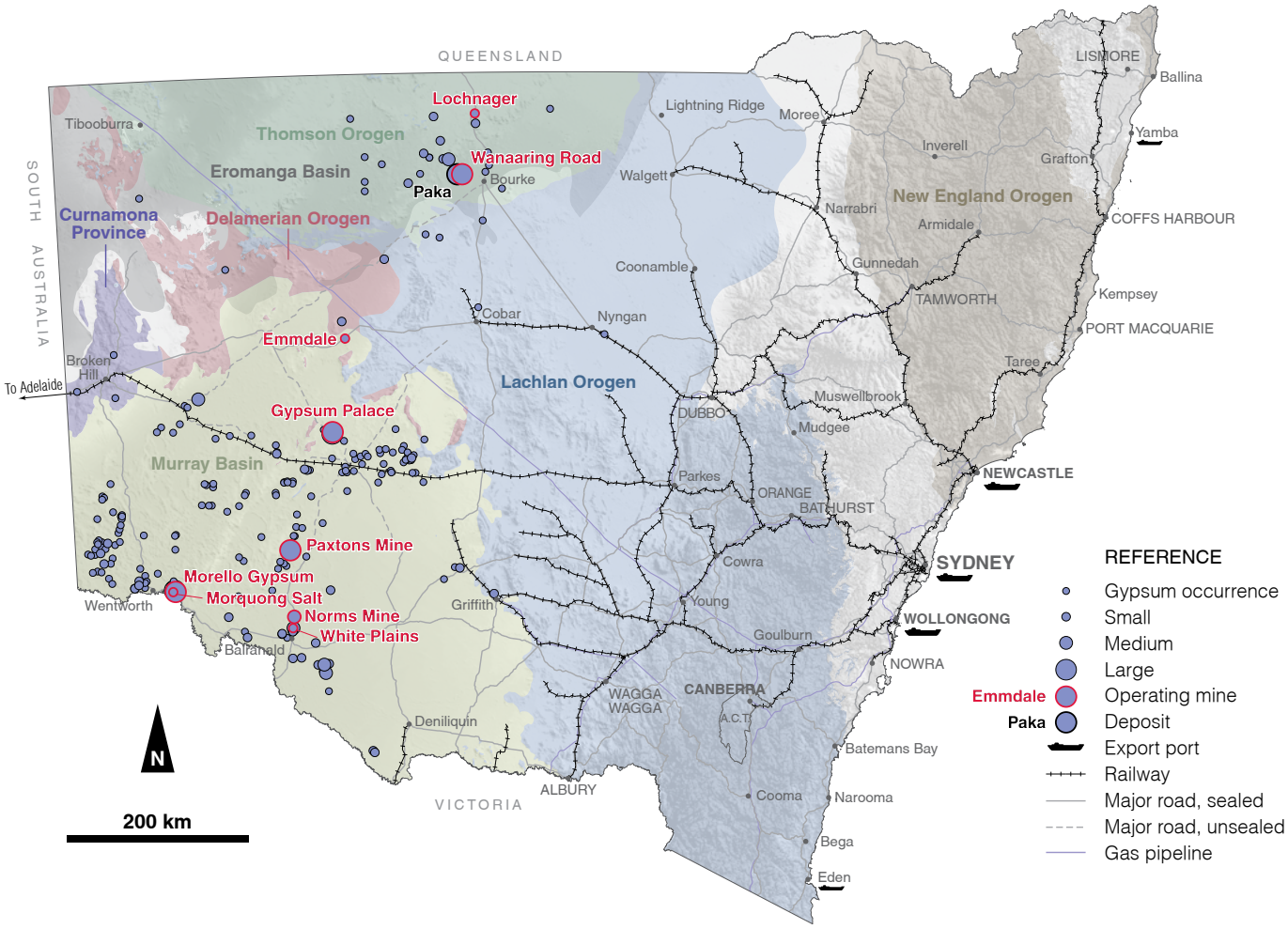

Overview

- Domestic demand for gypsum is strong.
- Western New South Wales (NSW) has excellent potential for large, high-grade gypsum deposits.
- Gypsum is critical for regional communities including far-western NSW, especially as a soil conditioner and for water purification.

Geological setting

Gypsum is an evaporative mineral that forms when saline water evaporates. Pure gypsum is hydrous calcium sulphate ($CaSO_4.2H_2O$) or selenite in pure, crystalline form. Minerals commonly associated with gypsum include anhydrite, halite, calcite, dolomite, celestite and borates.

Over 230 identified occurrences are known in NSW hosted by the Murray and Eromanga basins. They formed during the Quaternary (2.5 million years to present) with salinity introduced during numerous marine regressions and transgressions, followed by low rainfall and high evaporation during the last 10 000 years. Most gypsum deposits of commercial significance in NSW are associated with evaporative lakes, commonly bounded by lunettes (isolated dunes).

Deposit types

Gypsum deposit types include:

Rock gypsum – typically as massive layers with calcium carbonate.

Seed gypsum – small crystals like grains of wheat.

Kopi – weathered gypsum, commonly interbedded with other sedimentary deposits.

Spongy or cellular gypsum – associated with lake beds.

NSW GOVERNMENT

Highlights

- New South Wales currently produces about 400 000 tonnes per annum
- Kopi deposits in NSW can be very high purity (e.g. >77% $CaSO_4$ – Balranald district)
- Significant historical mines and districts include:
  - The Paka gypsum mine that produced over 210 000 tonnes for cement manufacture
  - Hillston
  - Trida-Ivanhoe
  - Wentworth
  - Balranald.

Development opportunities

Most production by volume in NSW to date has been of material suitable for agricultural use as a soil conditioner, including salt-affected land. Crops that are heavily reliant on gypsum include grape vines, mushrooms, cereal crops, lucerne and grasses. Demand typically increases after periods of drought. Smaller volumes of high-quality gypsum are also currently produced.

Potential exists for further development of NSWs high-grade deposits that are suitable for high-value applications such as:

- plaster board manufacture and high-quality building materials
- an essential ingredient in Portland cement
- pharmaceutical and medical applications (e.g. casts)
- fluxes for titanium manufacture
- mine rehabilitation
- a toothpaste additive
- a food additive to increase calcium content
- a water clarifier to settle solutes
- for wine making to assist in controlling the tartness of wine.
- sulphuric acid production
- a filler in paper manufacture.

Gypsum from Paxtons Mine, Murray Basin. Specimen is approximately 32 cm long.

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