**Heavy mineral sands**

**Opportunities in New South Wales, Australia**

**Overview**
- The Murray Basin of New South Wales (NSW) is a world-class heavy mineral (HM) sand province.
- Major mines are in production, with several projects under development.
- There is outstanding potential for the development of known resources and for the discovery of large HM sand deposits.

**Geological setting**

The Murray Basin is an intracratonic sedimentary basin known for its high quality coarse-grained rutile, zircon and ilmenite. It covers 300 000 km² of NSW, Victoria and South Australia. The Loxton-Parilla Sands, which extends over much of this area, hosts major heavy mineral sand deposits and is highly prospective for further discovery.

The Murray Basin of NSW is an emerging mineral sands province. The basin currently hosts over 120 Mt of heavy mineral sands. This inventory totals an estimated:

- 77.5 Mt ilmenite (FeO. TiO₂)
- 21.1 Mt rutile (TiO₂)
- 16.1 Mt zircon (ZrO₂. SiO₂)
- 5.7 Mt leucoxene (FeO.TiO₂)

It also has potential for monazite (Ce,La,Nd,Th)PO₄ — prospective for heavy rare earths — and xenotime (YPO₄).

**Highlights**
- Coarse-grained, linear strand-line deposits (e.g. Birthday Gift)
- High-grade deposits e.g. West Balranald and Nepean
- Finer-grained, dune deposits with high rutile content (e.g. Crayfish)
- Deposits that are partly or entirely amenable to dry mining
- Submarine sand barriers off the east coast of NSW with largely untested potential
Titanium feedstock end uses
Titanium pigment end uses
Zircon end uses

Titanium pigment 90%
Titanium metal 4%
Other 6%

Architectural coatings (paint) 36%
Plastics 22%
Other coatings (paint) 22%
Paper 9%
Inks 4%
Fibres 2%
Other 5%

Ceramics 54%
Foundry 12%
Refractories 12%
Chemicals 22%


Project highlights

Deposit name | Current resources and reserves (JORC) | Total contained HM (t)*
--- | --- | ---
Ginkgo | (measured) 135 Mt @ 2.9% HM, 43 Mt (indicated) @ 1.99% HM | –
Snapper | (measured) 117 Mt @ 5.4% HM | –
Atlas | (probable) 11.3 Mt @ 15.4% HM, (indicated) 21.8 Mt @ 9.6% HM | 2 092 800
Campaspe | (indicated) 97.37 Mt @ 4.72% HM | 4 596 000
West Balranald | (measured, indicated & inferred) 35.8 Mt @ 33.8% HM | 12 100 000
West Balranald & Nepean | (combined inferred resource) 50.1 Mt @ 32.2% HM | 16 100 000
Jacks Tank North | (inferred) 13.0 Mt @ 1.9% HM (coarse-grained) | 247 000
Jacks Tank South | (inferred) 41 Mt @ 2.6% HM (fine-grained) | 1 066 000
Crayfish | 144 Mt @ 1.34% HM | 1 929 600
Massidon | (indicated & inferred) 429.9 Mt @ 2.49% HM | 10 704 510
Copi North | (indicated & inferred) 14.2 Mt @ 6.6% HM | 937 200
Magic | (inferred) 15 Mt @ 3.7% HM | 555 000
Jaws | (inferred) 63 Mt @ 1.9% HM | 1 197 000

* Total heavy minerals calculated only from resource quoted above (not necessarily total valuable heavy minerals).

Heavy mineral sands production in New South Wales (1988–2019)

Ilmenite and leucoxene statistics not shown.

Source: NSW royalty statistics

Contact: mra.info@geoscience.nsw.gov.au | +61 2 4063 6500

Disclaimer: The information contained in this publication is based on knowledge and understanding at time of writing (October 2019), using publicly available information. Because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date. The information contained in this publication may not be or may no longer be aligned with government policy nor does the publication indicate or imply government policy. No warranty about the accuracy, currency or completeness of any information contained in this document is inferred (including, without limitation, any information in the document provided by third parties). While all reasonable care has been taken in the compilation, to the extent permitted by law, the State of New South Wales (including the NSW Department of Planning, Industry and Environment) exclude all liability for the accuracy or completeness of the information, or for any injury, loss, or damage whatsoever (including without limitation liability for negligence and consequential losses) suffered by any person acting, or purporting to act, in reliance upon anything contained herein. Users should rely upon their own advice, skills, interpretation and experience in applying information contained in this publication. The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by the Department over any equivalent product.