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 114 Mt of heavy mineral sands. This inventory totals an estimated:

- 69.3 Mt ilmenite (FeO. TiO₂)
- 21.78 Mt rutile (TiO₂)
- 15.1 Mt zircon (ZrO₂. SiO₂)
- 8.22 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

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Titanium feedstock end uses

- Titanium pigment 90%
- Titanium metal 4%
- Other 6%

Titanium pigment end uses

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

Zircon end uses

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


Project highlights

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

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

Heavy mineral sands production in New South Wales (1988–2017)

Ilmenite production statistics not shown.
Source: ABS, NSW royalty statistics

Ginkgo heavy mineral sands mine (courtesy of Cristal Mining Australia).

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