

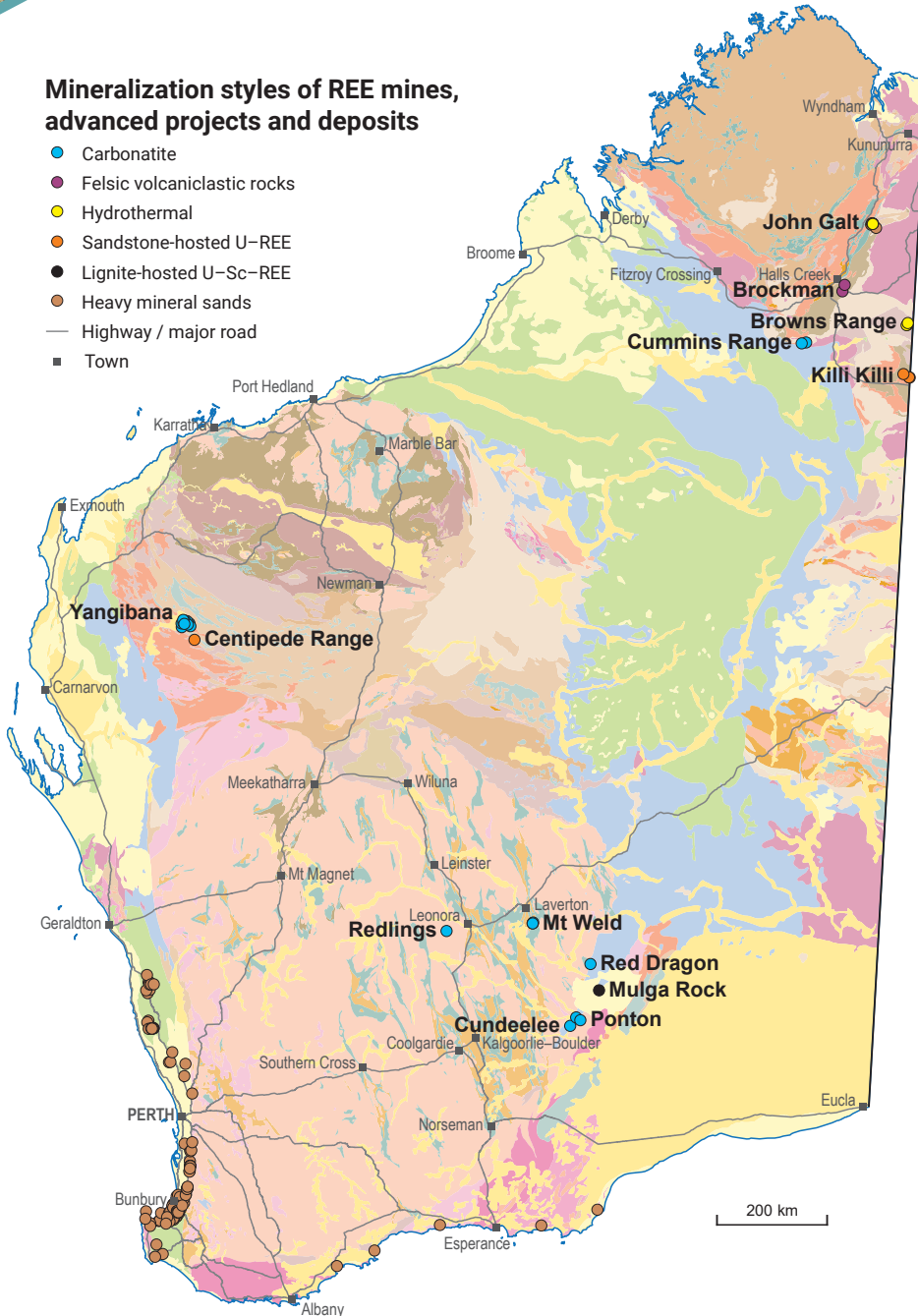
RARE EARTH ELEMENTS

INVESTMENT OPPORTUNITIES

WORLD-CLASS RESOURCE PROVINCE | SECURE INVESTMENT LOCATION
WORLD-LEADING GEOSCIENTIFIC DATA | GLOBAL MINING SERVICES INDUSTRY

Mineralization styles of REE mines, advanced projects and deposits

- Carbonatite
- Felsic volcanoclastic rocks
- Hydrothermal
- Sandstone-hosted U-REE
- Lignite-hosted U-Sc-REE
- Heavy mineral sands
- Highway / major road
- Town



Western Australia's Mt Weld mine continues to produce the majority of Australia's rare earth oxides

Mt Weld

- Record annual production for 2018–19 was 5898 t of neodymium praseodymium (NdPr) from 19 737 t of total rare earth oxide, processed in Malaysia
- Lynas Corporation has announced plans to relocate its cracking and leaching plant from Malaysia to Kalgoorlie. The \$500 million plant is expected to be operational in 2023

Browns Range

- First production from pilot plant began in December 2018 with 89.9 kt of rare earth carbonate produced at the end of September 2019
- Pilot Plant was partially restarted in July 2020
- Recent drilling at Dazzler deposit has identified potential as a source of high-grade ore for mining

Yangibana

- Mine construction is planned for 2020 following a second pilot plant study in 2019 which achieved a recovery rate of 80%. An on-site processing plant will produce a mixed rare earth elements carbonate product
- Approvals have been received for mining and processing operations

\$259 m*
Sales value



22 149 t
Tonnes sold



228
Full-time employees



\$1278 m*
Investment projects



3rd
Production world ranking



(2019–20 financial year)

* Annual sales and amount of contained REE oxides after ore processing; campaign mining precludes a quote of annual ore production

† Includes projects planned, possible, committed or under construction as of September 2020



REE ranked by contained TREO >60 kt

Resources estimated according to JORC 2012

Project	Status	Owner	Host rocks	Resources (Mt)	Av. grade* (% TREO)	Contained TREO (kt)	REE dominance	Resource date
Mt Weld	Operating	Lynas	regolith, carbonatite	55.2	5.36	2959	LREE	30/06/2019
Yangibana	Feasibility	Hastings Technology Metals / Mojito Resources	carbonatite	23.0	1.14	263	LREE	25/02/2020
Cummins Range	Exploration	Rarex	regolith, carbonatite	13.0	1.13	147	LREE	15/10/2019
Brockman	Pre-feasibility	Hastings Technology Metals	trachytic tuff	41.4	0.21	87	LREE, HREE	31/12/2015
Browns Range	Operating	Northern Minerals	hydrothermal	9.3	0.67	62	LREE	07/04/2020

* Total lanthanide rare earth oxides, including yttrium

Abbreviations: LREE, light rare earth elements; HREE, heavy rare earth elements; TREO, total rare earth oxide
Resource estimates have been rounded

Classification of REE

57 La 138.91	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97	39 Y 88.906
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LREE

HREE

Note: all promethium (Pm) isotopes are radioactive. Therefore, promethium cannot be recovered from mineralized ore

REE prospectivity of Western Australia

Western Australia has great exploration potential for REE in:

- carbonatite and alkaline to peralkaline ring complexes
- felsic volcanoclastic rocks
- hydrothermal systems
- heavy mineral sands
- sandstone-hosted and lignite-hosted U-REE

Currently REE are used across the technology, automobile and renewable sectors in:

- batteries in electric and hybrid cars
- smart phones and computers
- magnets
- pigments and chemical catalysts

MINEDEX

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