

WESTERN AUSTRALIA

Selected exploration and mining highlights



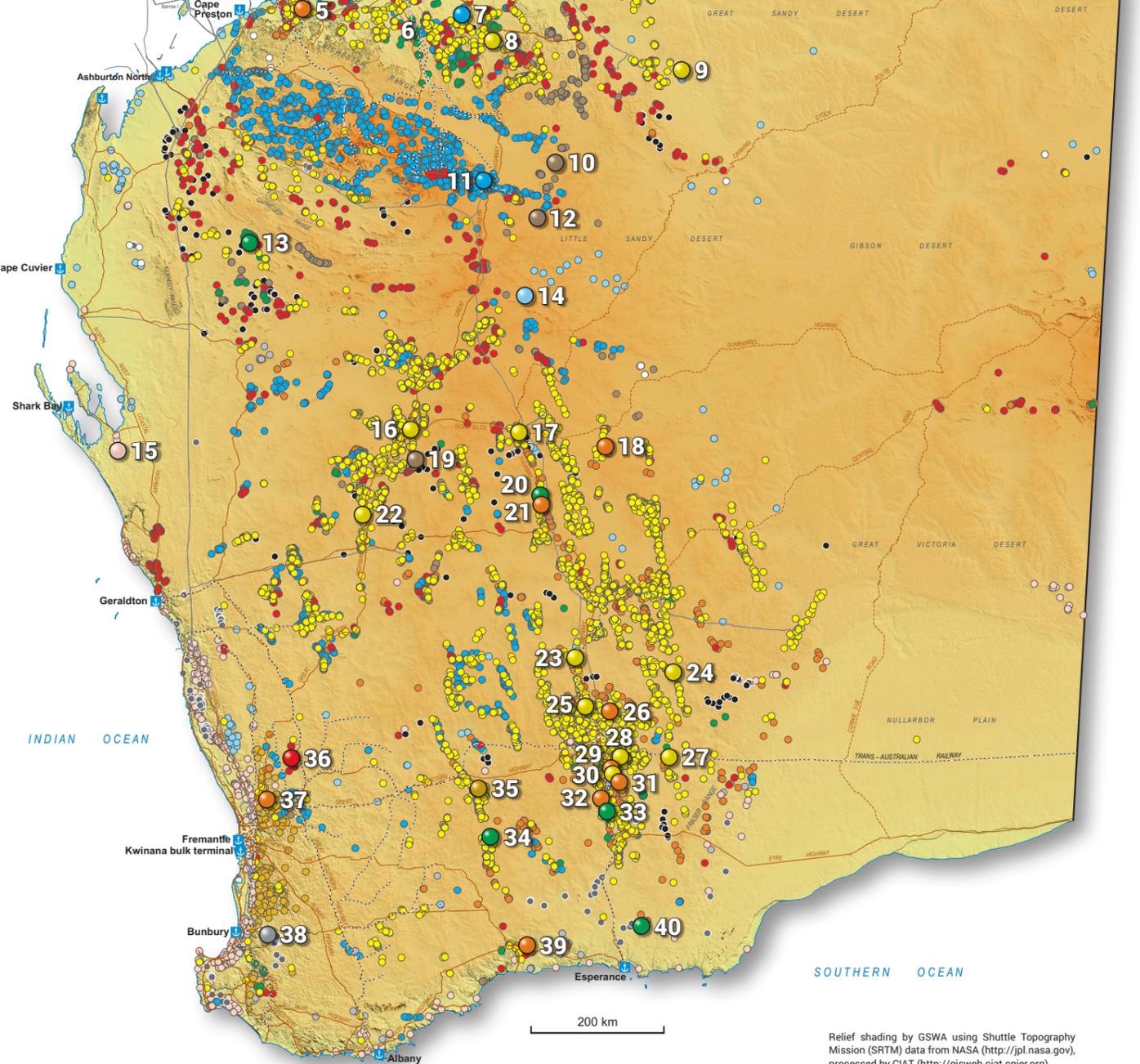
Mines, deposits and prospects

- Iron (Fe)
- Gold (Au), Silver (Ag), Stibnite (Sb)
- Alumina (Al), Kaolin
- Heavy mineral sands (HMS), Silica
- Nickel (Ni), Cobalt (Co), Platinum (PGE), Chromium (Cr)
- Copper (Cu), Lead (Pb), Zinc (Zn)
- Lithium (Li), Rare Earth Elements (REE), Tin (Sn), Tantalum (Ta)
- Vanadium (V), Manganese (Mn), Tungsten (W), Molybdenum (Mo)
- Phosphate, Potash and Salt
- Graphite
- Diamond
- Coal
- Uranium

Compound elements and other abbreviations

- Bt Billion tonnes
- DFS Definitive feasibility study
- DSO Direct shipping ore
- g/t Grams per tonne
- GSWA Geological Survey of Western Australia
- HMS Heavy mineral sands
- koz Thousand ounces
- kt Thousand tonnes
- ktpa Thousand tonnes per annum
- Li₂O Lithium oxide
- m Metre
- Moz Million ounces
- Mt Million tonnes
- Mtpa Million tonnes per annum
- NdPr Neodymium-praseodymium
- oz Ounces
- PFS Pre-feasibility study
- PGE Platinum group elements
- ppm Parts per million
- REE Rare earth elements
- SOP Sulfate of potash
- t Tonnes
- Ta₂O₅ Tantalum pentoxide
- TREO Total rare earth oxide
- V₂O₅ Vanadium pentoxide
- VHMS Volcanic hosted massive sulfide

- Highway / major road
- - - Unsealed road
- Railway
- Oil/gas pipeline
- Townsite
- Port



200 km

Relief shading by GSWA using Shuttle Topography Mission (SRTM) data from NASA (<http://jpl.nasa.gov>), processed by CIAT (<http://gisweb.ciat.gcri.org>)

1 Little Taraji River Copper + Cobalt + Silver Exploration	A high-grade massive sulfide zone was intersected at the Orion prospect with results of 16 m at 2.2% Cu, 38.7 g/t Ag, 6.6 g/t Au, 0.40% Co from 77 m, including 2 m at <0.1% Cu, 4.8 g/t Ag, 27.6 g/t Au, 1.5% Co from 77 m and 7 m at 4.7% Cu, 83.3 g/t Ag, 4.9 g/t Au, 0.20% Co from 82 m. <i>Dreadnought Resources Ltd</i>
2 Savannah Nickel + Copper + Cobalt Operating	First shipment of concentrate from Savannah North underground has left the Port of Wyndham. A total 10 865 t of Ni-Cu-Co concentrate was shipped in late December 2021 with a second shipment expected in February 2022. <i>Panoramic Resources</i>
3 Lamboo PGE Exploration	Step-out drilling from the Edison prospect further extended the known PGE mineralized zone by 1.2 km to the basal contact of the West Limb, Southern Ore Zone with drilling results of 100 m at 1.10 g/t Pt + Pd + Au from surface, including 66 m at 1.34 g/t Pt + Pd + Au from surface. <i>Pantororo Resources</i>
4 Cummins Range REE Exploration	Recent drilling results from the Cummins Range project include 21.9 m at 3.1% TREO with 0.6% NdPr, 0.2% Nb ₂ O ₅ , including 3 m at 10.6% TREO with 1.8% NdPr and 102.97 m at 1.6% TREO with 0.3% NdPr, 0.4% Nb ₂ O ₅ , including 46.97 m at 2% TREO with 0.4% NdPr and 0.5% Nb ₂ O ₅ . <i>Rarex Ltd</i>
5 Andover Nickel + Copper Exploration	Completion of the mineral resource drill-out at the VC-07 deposit yielded the highest individual Ni and Cu assays, including 15.2 m at 2.32% Ni, 0.96% Cu and 0.10% Co from 316.6 m, 6.5 m at 2.28% Ni, 0.55% Cu and 0.10% Co; 7.3 m at 3.28% Ni, 0.97% Cu and 0.14% Co from 76.8 m and 1.5 m at 5.04% Ni from 325.8 m. <i>Azure Minerals Ltd</i>
6 Pincunah Gold Exploration	Maiden drilling program at the Valley of the Gossans prospect within the Pincunah Gold project intersected potential VHMS-styled Ag-Cu-Zn mineralization with grades of 25 m at 6.7 g/t Ag from 112 m, including 3 m at 0.75% Cu and 20 m at 4.17 g/t Ag and 1.48% Zn from 171 m. <i>Trek Metals Ltd</i>
7 Miralga Creek Iron Under construction	The Miralga Creek project is under construction with 8 Mtpa of DSO to be produced from five open pits over a four- to five-year mine life. Ore will be transported to the Utah Point port facility for export. <i>Atlas Iron</i>
8 Warrawoona Gold Under construction	Construction is underway at the Warrawoona project with first gold production expected in mid-2022. A DFS is also underway to expand mining operations to include the Blue Spec deposit. Recent drilling at Blue Spec includes 4.1 m at 33.6 g/t Au from 194.9 m, including 2.2 m at 60.4 g/t Au and 1.1 m at 100.7 g/t Au from 196 m. <i>Calidus Resources</i>
9 Havieron Gold + Copper Under construction	A Stage 1 PFS for the South East Crescent proposes an initial nine-year mine life for a Probable Ore Reserve of 14 Mt at 3.72 g/t Au and 0.54% Cu for 1.6 Moz Au and 73 kt Cu. Construction of the underground decline continues and has now advanced to over 120 m from the portal. <i>Newcrest Mining Ltd, Greatland Gold Plc</i>
10 Flanagan Bore Manganese Exploration	A maiden Inferred Mineral Resource Estimate of 15 Mt at 11.3% Mn has been announced for the LRI prospect. <i>Black Canyon Ltd</i>
11 Hancock Ranges Iron Scoping	A maiden Mineral Resource Estimate of 10.4 Mt at 60.4% Fe has been announced for the Sirius Extension, Ridge E and Ridge C prospects. A scoping study was also completed with resources able to sustain an eight-year mine life based on a 1.25 Mtpa operation. <i>Alien Metals</i>
12 Oakover Manganese Exploration	Maiden Inferred Mineral Resource Estimated for the Hill 616 deposit comprises 57.5 Mt at 12.2% Mn, which includes a near-surface supergene manganese zone of 8.1 Mt at 17.4% Mn. The total project mineral resource estimate for Oakover now stands at 64 Mt at 10% Mn. <i>Firebird Metals Ltd</i>
13 Yangibana REE Under construction	Construction has begun at Yangibana following a 37% increase to the ore reserve of 16.7 Mt at 0.95% TREO. Production is scheduled for 2024 with a 15-year mine life. Conditional approvals to build a processing plant near Onslow to produce 15 ktpa of a mixed rare earth carbonate product have also been announced. <i>Hastings Technology Metals</i>
14 Beyondie Potash Operating	First batch of high-grade SOP from Beyondie was produced in October 2021 as a part of the final stages of commissioning of the processing plant. <i>Kalium Lakes Ltd</i>
15 Coburn Heavy Mineral Sands Under construction	Mine construction work for the Coburn HMS project commenced with production of a heavy metal concentrate expected in 2022. <i>Strandline Resources Ltd</i>
16 Side Well Gold Exploration	High-grade shear-hosted Au intersections have been reported from the Mulga Bill prospect with best intersections of 6 m at 39.15 g/t Au from 101 m, including 3 m at 74.51 g/t Au from 101 m and 9 m at 24.19 g/t Au from 193 m, including 1 m at 184.78 g/t Au from 193 m. <i>Great Boulder Resources Ltd</i>
17 Matilda Gold Operating	Resource development drilling at the Happy Jack prospect intersected multiple high-grade Au zones. Results include 1.99 m at 298.8 g/t Au from 157.21 m, including 0.76 m at 773.0 g/t Au from 157.8 m, and 20 m at 7.33 g/t, including 2.22 m at 30.26 g/t and 4.00 m at 5.27 g/t from 170 m. <i>Wiluna Mining Corporation Ltd</i>
18 Fischer East Nickel Exploration	Drilling at the Musket prospect intersected a high-grade zone, comprising 14.94 m at 1.90% Ni from 366.15 m, 5.81 m at 2.29% Ni from 584.35 m and 5.67 m at 1.84% Ni from 584.35 m extending the mineralized zone. The Mineral Resource Estimate for the Fischer East project, comprising the Camelwood, Cannonball and Musket prospects, is 4.2 Mt at 1.9% Ni. <i>Canning Resources</i>
19 Yarrabubba Vanadium Exploration	The Mineral Resource Estimate for the Yarrabubba deposit has been updated with a 32% increase in the mineral resource to 36.6 Mt at 0.8% V ₂ O ₅ . <i>Technology Metals Ltd</i>
20 Kathleen Valley Lithium Feasibility	A DFS for Kathleen Valley anticipates first production of spodumene concentrate in 2024 with a 23-year mine life based on an Ore Reserve Estimate of 68.5 Mt at 1.34% Li ₂ O and 120 ppm Ta ₂ O ₅ , and additional production capacity of 4 Mtpa to produce ~700 ktpa of spodumene concentrate. A downstream scoping study has also been completed for an integrated mining, processing and refining operation at Kathleen Valley to produce battery-grade lithium hydroxide monohydrate from spodumene concentrate. <i>Liontown Resources</i>

21 Cosmos Nickel Under construction	First development ore has been intersected at the Odysseus South mine during mine development. The ore has been stockpiled as the construction of the concentrator complex is underway, which is due to produce first concentrate in late 2022. <i>Western Areas Ltd</i>
22 Cue-Moyagee Gold Exploration	A new shallow, high-grade lode was intersected at the White Heat prospect with a peak result of 15 m at 111.6 g/t Au from 25 m, including 5 m at 313.4 g/t Au from 26 m. <i>Musgrave Minerals Ltd, Evolution Mining Ltd</i>
23 East Menzies Gold Operating	The first gold pour from the Granny Venn mine took place at the Lakewood Gold Mill with a recovery of 1766 oz Au (recovered grade 2.23 g/t Au) from 24 459 t of ore (head grade 2.47 g/t Au). <i>Resources & Energy Group Ltd</i>
24 Patricia Gold Exploration	Maiden drilling program at the Patricia project intersected 5 m at 37.11 g/t Au from 154 m, including 1 m at 16.00 g/t Au from 154 m, 1 m at 63.60 g/t Au from 155 m and 1 m at 90.40 g/t Au from 156 m and 1 m at 13.25 g/t Au from 157 m. <i>OzAurum Resources</i>
25 Eureka Gold Exploration	A new footwall zone of high-grade gold has been discovered north of the Eureka Pit. Significant results include 4 m at 32.08 g/t Au from 104 m, including 1 m at 116 g/t Au from 104 m, and 6 m at 13.88 g/t Au from 38 m, including 1 m at 56.6 g/t Au from 41 m. <i>Red Dirt Metals</i>
26 Black Swan Nickel Exploration	Maiden Mineral Resource Estimate for the Golden Swan mine stands at 160 kt at 3.9% Ni for 6250 t contained nickel. The total project mineral resource for Black Swan Project increased to 219 600 t at 7% Ni for 15 330 t of contained Ni. <i>Poseidon Ltd</i>
27 Karonie Gold Exploration	A maiden Mineral Resource Estimate of 2.96 Mt at 1.2 g/t Au for 111 koz of gold for the Taupo, KZ5 and Parmelia deposits has been announced. <i>Alchemy Resources Ltd</i>
28 Mt Monger North Gold Exploration	Infill drilling at the Providence prospect returned high-grade gold intersections, including 8 m at 16.15 g/t Au from 60 m, including 1 m at 111.4 g/t Au from 61 m, 8 m at 31.84 g/t Au from 66 m, including 1 m at 37.03 g/t Au from 68 m and 1 m at 190.06 g/t Au from 70 m. <i>Monger Gold Ltd</i>
29 Kambalda Nickel Under development	First ore has been intersected in mine development earlier than expected at Durkin North . This high-grade zone averaging 3.8% Ni, sits 36 m outside the current modelled mine plan and could potentially represent an additional lode. <i>Mincor Resources NL</i>
30 Beta Hunt Gold Operating	A new mineralized zone was intersected beneath the 50C Trough with results of 4 m at 40.5 g/t Au. Infill and step out drilling at the Larkin Zone extended the known mineralization to over 1 km with new results of 3.5 m at 20.5 g/t Au, including 0.4 m at 87.9 g/t Au. <i>Karara Resources Ltd</i>
31 Foster Jan Nickel Exploration	Drilling at the eastern limb of the Coocoe Anticline intersected 5 m at 2.39% Ni from 286 m, including 2 m at 5.07% Ni from 289 m in the East Trough prospect and 9 m at 1.66% Ni from 113 m, including 1 m at 7.44% Ni from 113 m, in the Baker (East Coocoe Hangingwall) prospect. <i>Lunnon Metals Ltd</i>
32 Widgiemootha Nickel Under construction	Formal commencement of the Ore Tolling and Concentrate Purchase Agreement with BHP Nickel West, indicating intention to supply first ore for processing in Q2 2022. New high-grade massive sulfide mineralization has also been intersected at the Hartley Prospect with drilling results of 1.3 m at 5.6% Ni. <i>Mincor Resources Ltd</i>
33 Dome North Lithium Exploration	Drilling at the Cade prospect intersected high-grade Li with drilling results of 21 m at 1.08% Li ₂ O and 24 m at 1.29% Li ₂ O from surface. A Mineral Resource of 11.2 Mt at 1.21% Li ₂ O has been estimated for Dome North . <i>Essential Metals</i>
34 Mt Holland Lithium Under construction	Construction has begun at the Mt Holland project, which includes an open pit mine and a lithium hydroxide refinery in Kwinana. Once operational, the refinery will target 50 ktpa of battery-grade lithium hydroxide with first production expected in 2024. <i>Covalent Lithium Ltd</i>
35 Airfield Kaolin Exploration	The maiden drilling program at the Boomerang kaolin prospect intersected 10 m at 7% halloysite from 40 m. Further drilling is underway to identify the geographic extent and resource potential. <i>Kula Gold Ltd</i>
36 Caravel Copper + Molybdenum Exploration	An updated Mineral Resource Estimate of 1.18 Bt at 0.25% Cu and 48 ppm Mo has been announced for the Caravel project. A revised scoping study targeting a modified flowsheet and expansion options is anticipated in early 2022. <i>Caravel Minerals Ltd</i>
37 Julimar Nickel + Copper + PGE Exploration	Maiden Mineral Resource Estimate announced for the Gonneville deposit stands at 330 Mt at 0.94 g/t Pd+Pt+Au, 0.16% Ni, 0.10% Cu, 0.016% Co. Additional step-out drilling at the Hartog target , lying along the northwestern limit of the Gonneville deposit, intersected shallow high-grade PGE-Ni-Cu-Co sulfides including 3 m at 2.0 g/t Pd, 0.3 g/t Pt, 0.6% Ni, 0.5% Cu, 0.05% Co from 68 m and 2 m at 1.8 g/t Pd, 0.2 g/t Pt, 0.6% Ni, 0.5% Cu, 0.06% Co from 139.2 m. <i>Chalice Mining</i>
38 Collie Graphite Hub Graphite Feasibility	A new R&D plant will be built at Collie to produce battery-grade spherical graphite, using raw materials feedstock from Comet Resources' Springdale graphite project. A \$2 million State Government grant from the Collie Futures Industry Development Fund will support the initial stages of its development. <i>International Graphite</i>
39 Ravensthorpe Nickel + Cobalt Operating	Minister for Mines and Petroleum Bill Johnston opened the newest open pit mine at the Ravensthorpe nickel-cobalt operations. The Shoemaker-Levy mine is expected to produce nickel and cobalt for the next 20 years. <i>First Quantum Minerals Ltd, POSCO Ltd</i>
40 Mount Ridley REE Exploration	REE mineralization associated with ionic adsorption clays has been identified over five prospects Winston, Keith, Tyrrell, Marcellus and The Lake in the Eucla Basin. Re-analysed historical pulps returned elevated REE values with a peak of 1 m at 1.05% TREO from 23 m. <i>Mount Ridley Mines</i>

For more information, contact: mindex@dmirs.wa.gov.au

WESTERN AUSTRALIA THE WORLD'S PREMIER MINING STATE

Fees, securities and minimum expenditures

1 July 2021	Maximum area	Term	Application fee	Rent	Security	Minimum annual expenditure*
Prospecting Licence	200 ha	4 years (then 4-year extension)	\$393	\$3.30 per ha Min: \$33	\$5k each	\$40 per ha Min: \$2k
Special Prospecting Licence for Gold	10 ha (maximum)	Min 3 months (then 3-month extension up to 4 years)	\$393	\$33	\$5k each	\$2k
Exploration Licence	70 blocks normally (200 blocks in greenfield areas)	5 years (then 2-year extension)	1 Block \$414 > 1 Block \$1660	# Per block Years 1-3 \$146 Years 4-5 \$262 Years 6-7 \$358 Years 8+ \$677	\$5k each	# Years 1-3 ≤ 20 blocks Min: \$10k-20k > 20 blocks \$1k per block
Mining Lease Minerals Dissolved in Brine	Not applicable	21 years renewable	N/A	# Years 1-5 \$2.60 per ha	\$5k each	\$100 per ha Min: \$5k if <5 ha otherwise \$10k
Mining Lease	Not applicable	21 years renewable	\$579	\$22 per ha	\$5k each	\$100 per ha Min: \$5k if <5 ha otherwise \$10k
General Purpose Lease	10 ha or larger with Minister's approval	21 years renewable	\$579	\$19.70 per ha	\$5k each	Covenant in lieu
Miscellaneous Licence	Not applicable	21 years renewable	\$579	\$19.70 per ha	\$5k each	Covenant in lieu

* https://www.dmp.wa.gov.au/Documents/Minerals/Minerals-Feesandcharges_2021-22.pdf

ha = hectare (100 x 100 m)
Block = 3 km² approx.

* includes rent payments

Examples of royalty rates

The full list of royalty rates is in Regulation 86 of the Mining Regulations, 1981 or the relevant State Agreement

Limestone (construction/metallurgical)	\$0.73 – \$1.17 per tonne
Coal	7.5% if exported
Bauxite	7.5%
Copper	5% (concentrate); 2.5% (metal)
Nickel in concentrate	\$ royalty = 2.5 x D x f/100 D: % Ni in concentrate f: Ni metal price per tonne
Lithium minerals	5%
Iron ore (DSO) fines/lump	7.5%
Beneficiated iron ore and magnetite	5%
Gold (2500 oz exempt)	2.5% of metal value
Zircon concentrate	5% of sales value

■ Tonnage-based rates ■ Sales value-based rates

DSO = Direct Shipping Ore

January 2022

Geoscience and resource information

All free via www.dmirs.wa.gov.au

- Maps and reports
- Live databases of mineral deposits and mineral exploration reports
- Downloads of vector files for maps and databases
- Geophysical data and images
- Geochemical data
- Online GIS facility

Exploration and mining licence information

All free via www.dmirs.wa.gov.au

- Online map service (TENGRAPH Web) continuously updated showing location of all licences and applications
- Full ownership and other data for all licences available via online system, Mineral Titles Online (MTO)
- Transparent licence system where all licence information can be viewed by anyone

Comprehensive and well-known mining legislation

Free download of Mining Act and Regulations from www.legislation.wa.gov.au

This site also has current copies of all other WA legislation

- Titles are for 'all' minerals*
- First in time application system
- Security of tenure when moving from exploration to mining title
- Mining title can be granted at pre-feasibility stage
- Annual exploration expenditure commitments
- Annual 'rental' fee for licence
- Annual reporting of activities

Exploration licences

- Graticular system used based on a 'block' that is 1 minute of latitude x 1 minute of longitude.
- Maximum number of blocks:
 - in greenfields areas: 200
 - in non-greenfields areas: 70
- If after five years the licence is extended, 40% of the area must be surrendered at end of 6th year

Mining lease applications

There are two ways to submit applications

- 'Mining proposal' involving environmental assessment before grant; or
- Mineralisation Report and Supporting Statement, or Resource Report and Supporting Statement. Mining proposal and environmental assessment submitted for approval at later date

Very large projects (e.g. iron ore, diamonds, alumina) may involve a Special Agreement with the State Government

- * Legislation gives Ministerial discretion to restrict minerals or refuse in public interest. Rules of procedural fairness apply

MINING TENEMENTS



as at January 2022

Taxes and mining royalties

Mining tax

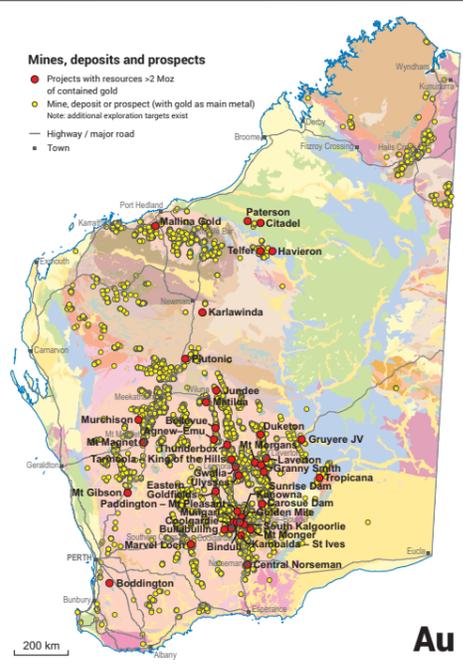
- Normal company tax rate ranges between 27.5% and 30% on profit
- Goods and services tax of 10%

Royalties on production

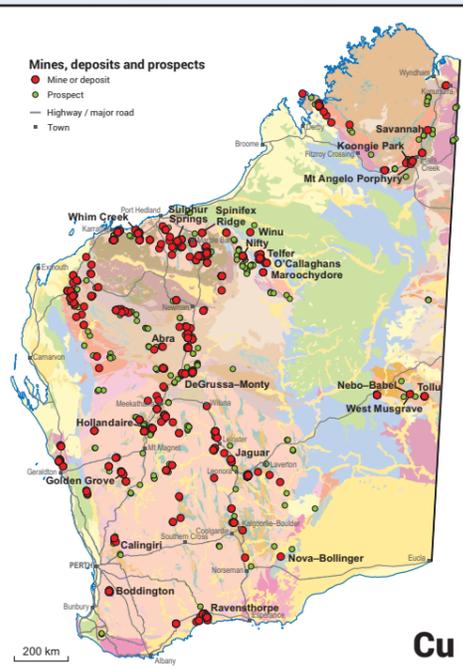
- The Mining Act and Regulations or the various State Agreement
- Acts set out royalty provisions and royalty rates
- The amount of royalty paid is a deduction for income tax assessment
- The amount of royalty paid can be reduced by allowable costs involved in transporting the mineral to the purchaser

Royalties are levied on the basis of:

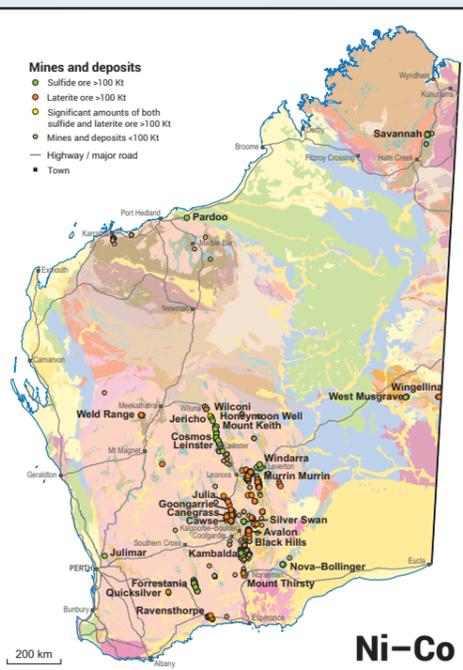
- tonnage (rock, gravel, limestone)
- sales value (most metals, gems, diamonds)



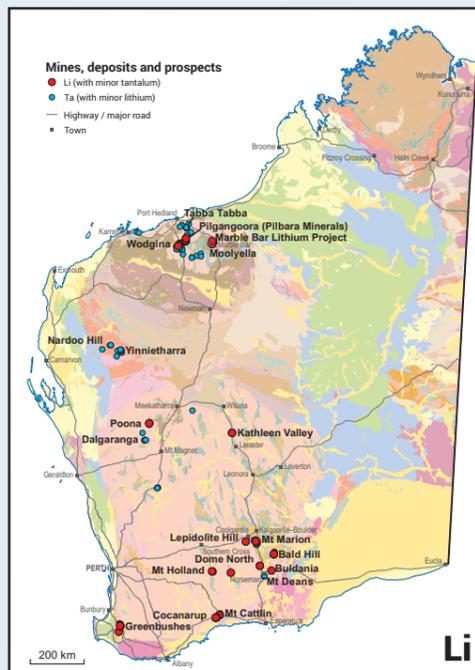
Au



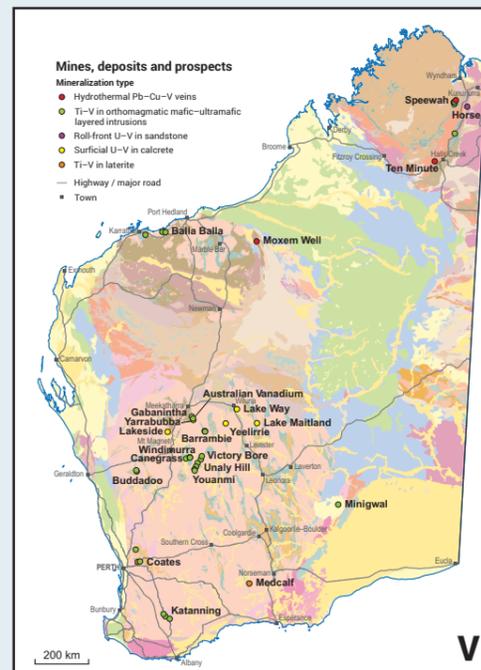
Cu



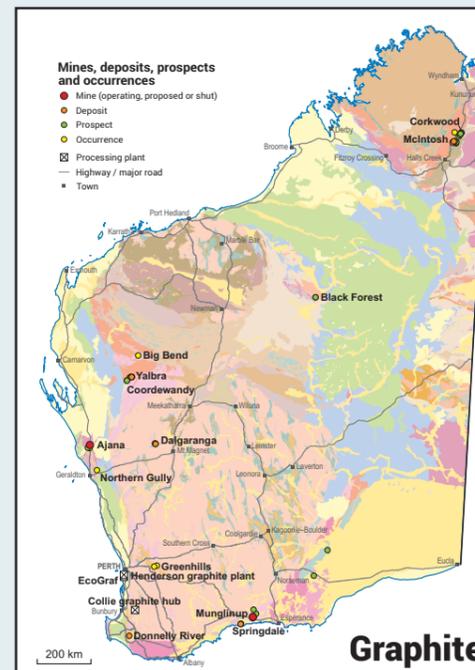
Ni-Co



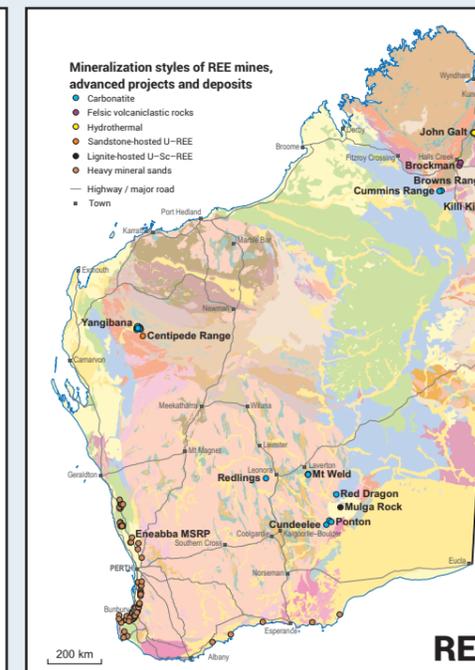
Li



V



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REE

WA Department of Mines, Industry Regulation and Safety (the principal mineral industry regulator)
www.dmirs.wa.gov.au

Department of Jobs, Tourism, Science and Innovation (coordinates the development of major resource and infrastructure projects)
www.jtsi.wa.gov.au

WA State Law Publisher (free downloads of WA legislation)
www.legislation.wa.gov.au

Department of Foreign Affairs and Trade
www.dfat.gov.au

Australian Tax Office
www.ato.gov.au

Austrade (Australian Trade Commission)
www.austrade.gov.au