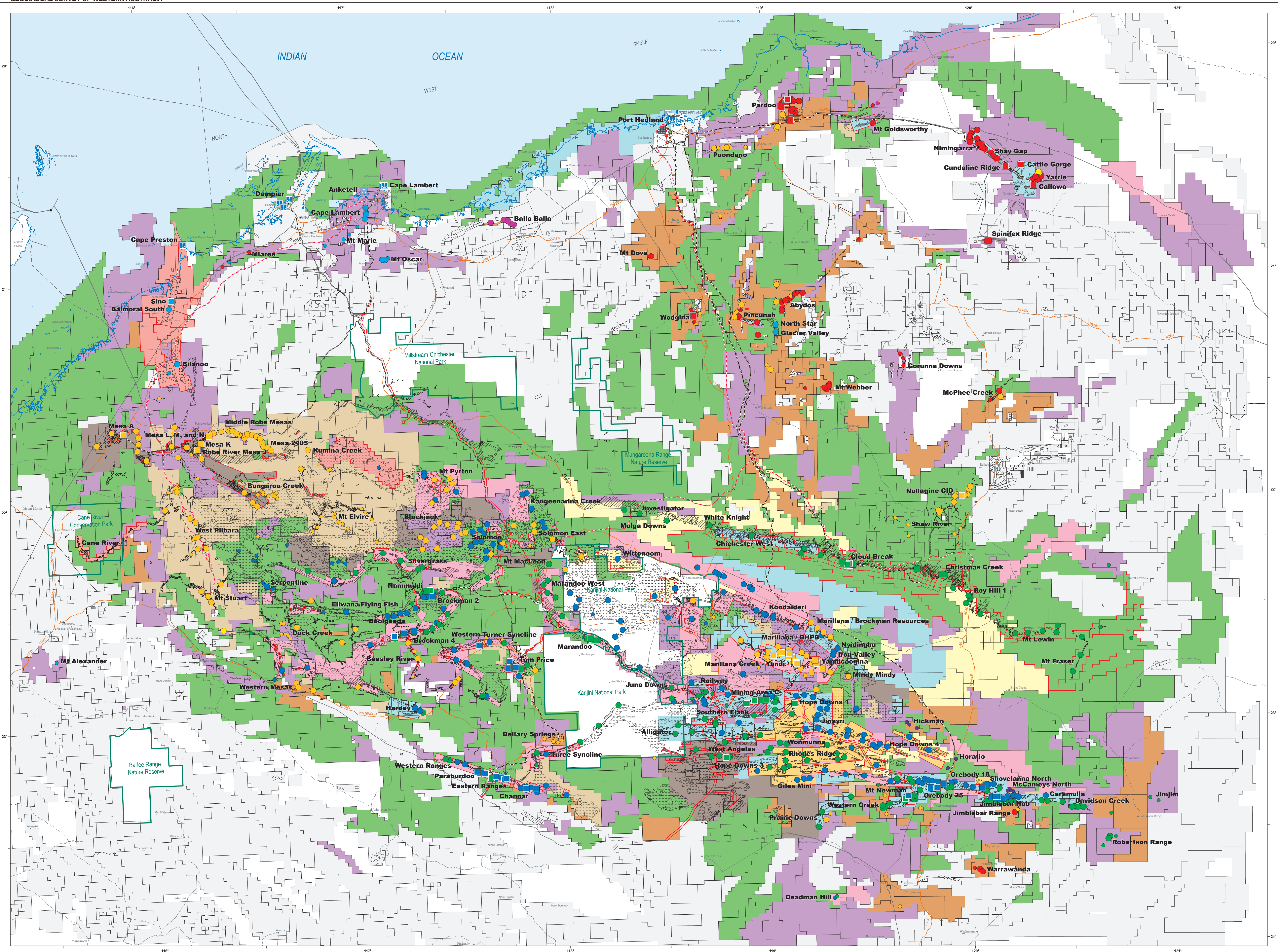


GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

IRON ORE DEPOSITS OF THE PILBARA REGION — 2011



SITE TYPE AND STAGE OF DEVELOPMENT

(Symbol coloured by iron ore mineralization style)

- Operating mine
- Proposed mine, closed mine, or mineral deposit — with a mineral resource estimate
- Exploration site or prospect — without a mineral resource estimate

MINERALIZATION STYLES

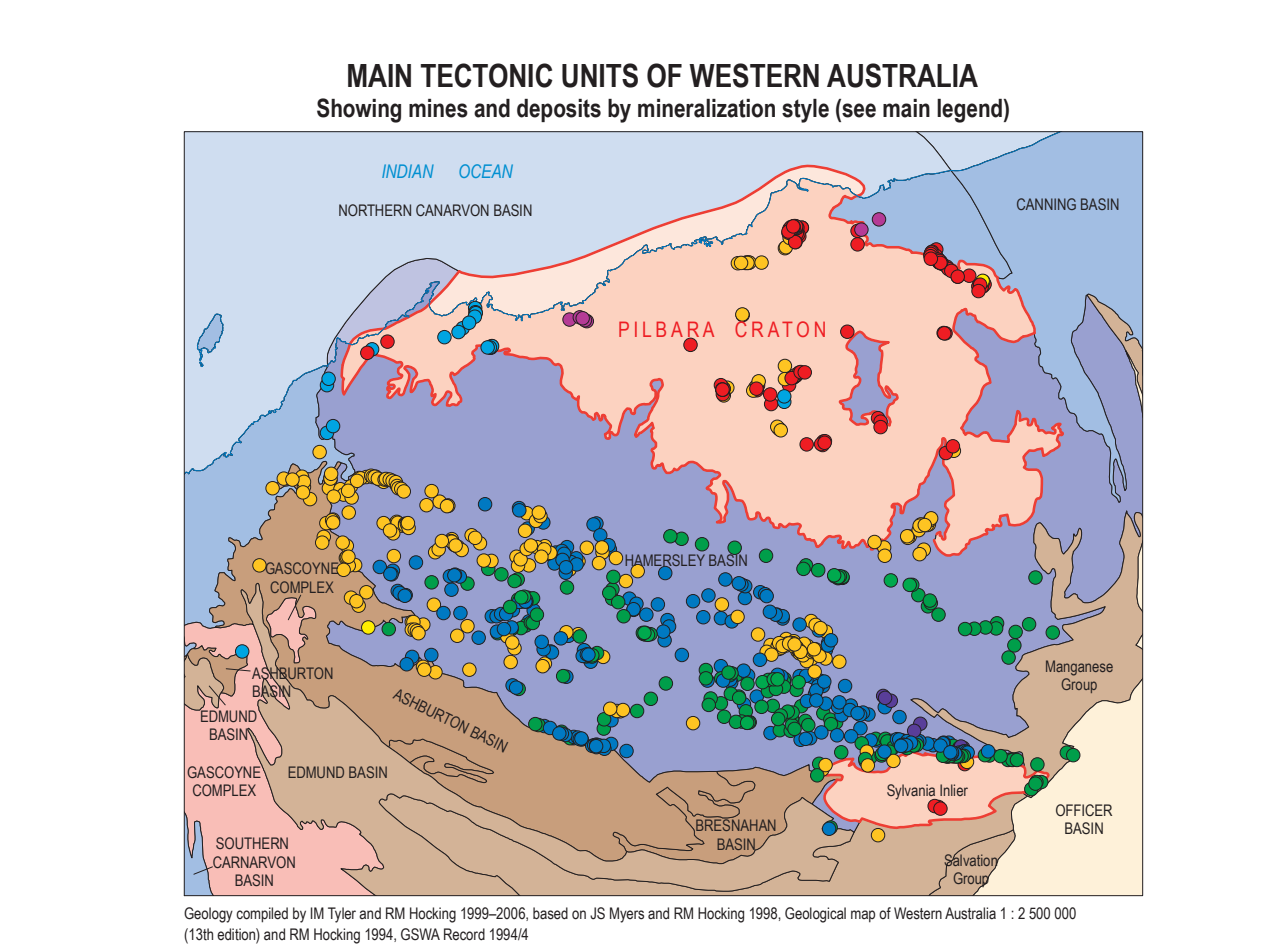
- Paleoproterozoic massive paleochert mineralization or channel iron deposits (CIC) of the **Caracal Robe Pileolite** and **Pondano** Formation. Mineralization style is **Regolith-alluvial to beach placer mineralization**
- Hematisitic conglomerate of the **Neoproterozoic El Creek Formation** (Tarcu Group, Officer Basin), which formed in a near-shore environment (mined at Yampi 10) and hematite conglomerate of the **Paleoproterozoic Mt McGrath Formation** (Wyllie Group, Ashburton Basin). Mineralization style is **Stratiform sedimentary — chert-hosted**
- Supergene-enriched hematite and hematite-goethite mineralization hosted by banded iron formation of the **Boodgeda Iron Formation** or the **Wingarra Rhyolite** (Hartley Basin). Includes nearby zones and detailed deposits derived from the **Boodgeda Iron Formation** or the **Wingarra Rhyolite**. Mineralization style is **Sedimentary — banded iron-formation (supergene enriched)**
- Supergene-enriched hematite and hematite-goethite mineralization hosted by banded iron-formation of the **Brookman Iron Formation** (Hartley Basin). Includes nearby zones and detailed deposits derived from the **Brookman Iron Formation**. Mineralization style is **Sedimentary — banded iron-formation (supergene enriched)**
- Supergene-enriched hematite and hematite-goethite mineralization hosted by banded iron-formation of the **Marra Mamba Iron Formation** (Hartley Basin). Includes nearby zones and detailed deposits derived from the **Marra Mamba Iron Formation**. Mineralization style is **Sedimentary — banded iron-formation (supergene enriched)**
- Supergene-enriched hematite and hematite-goethite mineralization hosted by banded iron-formation **Caveview Formation** and **Picouah-Banded-iron Member** of the **Archean Pilbara Craton**. Includes nearby zones and detailed deposits. Mineralization style is **Sedimentary — banded iron-formation (supergene enriched)**
- Magnetite-rich banded iron-formation or taconite. May be hosted by iron formations of the **Archean granite-greenstone terranes**, the **Neoproterozoic-Paleoproterozoic Hartley Basin**, or the **Konkarra Metamorphics** of the **Gascoyne Complex**. Mineralization style is **Sedimentary — banded iron-formation (taconite)**
- Orthomagnetic layered mafic intrusives targeted for both iron (magnetite) and V-Ti (ilmenite)

IRON ORE TENEMENTS AND MINISTERIAL RESERVES BY COMPANY GROUP

- BHP Billiton plus joint ventures (JV) with CI Minerals (Ibico), Mtsu, POSCO, JFE Steel, and other Wheelara JV companies
- Rio Tinto plus JV with CMEC (Snoote) and Basecell
- Rio Tinto plus JV with Hancock Prospecting and Wright Prospecting
- Hancock Prospecting
- Robe River Iron Associates (Rio Tinto, Mtsu, Nippon Steel, Sumitomo)
- Mineralogy group of companies
- Fortescue Metals Group plus JV with Consolidated Minerals, BC Iron Ltd, Cullen Resources Ltd, and Talcum Mining Ltd. Includes iron ore tenements of Fortescue Metals Group, FMG Pilbara, and FMG Chichester
- Atlas Iron Ltd plus JV with companies such as Talcum Minerals Pty Ltd, De Grey Mining Ltd, Chalco Gold Mines Ltd, etc. Includes iron ore tenements of Graila Resources NL and Auron Resources Ltd
- API Management Pty Ltd (50% Aquila Resources Ltd and 50% AMCI Holdings Australia Pty Ltd) with JV partners such as De Beers Australia Exploration Ltd, Red Hill Iron Ltd, Cullen Resources Pty Ltd, Graila Resources NL, and Helix Resources Ltd
- Other — iron ore and Ministerial Iron Ore Temporary Reserves. Some of these tenements may be joint ventured with the company groups above
- Other — not known as being explored for iron ore

IRON ORE GEOLOGY

- Zones of supergene enrichment
- Channel iron deposits and pileolite (Robe Pileolite and Pondano Formation)
- Brookman Iron Formation (note: also includes some West Woll Formation)
- Marra Mamba Iron Formation
- Banded iron-formation in granite-greenstone terrane



Major road
Formed road
Track
Railway, operating
Railway, proposed
Gas pipeline, operating
Gas pipeline, proposed
Oil pipeline, operating
Iron ore port, operating or under development
Iron ore port, proposed

Townsite
population 10 000 – 15 000
1000 – 10 000
less than 1000
Homestead
Locality
Conservation estate boundary
State Agreement Act Boundary
External
Internal (Fortescue Metals Group plus JV only)

Theme	Data Currency	Organization
Technic units	2001	Geological Survey of Western Australia, Department of Mines and Petroleum
Iron ore geology	1990	Geological Survey of Western Australia, Department of Mines and Petroleum
Supergene enrichment	1991	Geological Survey of Western Australia, Department of Mines and Petroleum
Mines and deposits	MAR 2011	Geological Survey of Western Australia, Department of Mines and Petroleum
Mining tenements	FEB 2011	Mineral Titles Division, Department of Mines and Petroleum
Cadastral	FEB 2011	Landgate, Department of Mines and Petroleum
Topography	2010	Landgate
Coastline	1990	Coastwatch Australia
Rail	OCT 2004	BHP Billiton, Hartley Iron, Hancock Prospecting, FMG, API

Compiled by Cooper, RW and Flint, DJ 2011
Cartography by PJ Blackhouse
Editorial by C. Chevalier and G. P. Williams
Information on mines, deposits, prospects, and processing plants was extracted from the mines and mineral deposits (MMD) database, DMPI in March 2011. Most detailed information on sites, tenements, company groupings, and geology are available on an accompanying CD.
Published by the Geological Survey of Western Australia
This map is published in digital format (PDF) and is available online at <http://www.dmp.wa.gov.au/GSWA/publications/>.
First copies of this map are available from the Information Centre, Department of Mines and Petroleum,
100 Park Street, East Perth, WA 6004.
Phone (08) 9222 3400 Fax (08) 9222 3444
Website: <http://www.dmp.wa.gov.au/gswa/> Email: geological_survey@dmp.wa.gov.au
The recommended reference for this map is:
Cooper, RW and Flint, DJ 2011, Iron ore deposits of the Pilbara region — 2011 (1:750 000 scale), Geological Survey of Western Australia.

Tenements are colour coded if they are known to be targeted for iron ore from a combination of iron ore State Agreement Acts, authorization to explore for iron ore granted or applied for under Section 111 of the Mining Act 1978, and company public announcements. This includes tenements at the application stage. Indicated iron tenements have been extracted from the tenement applications will be greater or that iron ore authorization under Section 111 will be granted. Other tenements shown in grey may also be prospective for iron ore. Colour coded iron ore tenements may also be prospective for other minerals.
Mineralogy Licenses (L) have been plotted but not given their specific company colour coding; the colour coding of the underlying tenements are shown instead.
The tenement layer consists of many tenements (both granted and pending applications) that overlap in time and space with complex relationships. However the tenements are depicted as they form a 2D layer. Care should be taken when interpreting the colour coded tenements and, where necessary, further details should be obtained from the accompanying digital product or from DMPI's online mining tenement database (TSDMPT).

Government of Western Australia
Department of Mines and Petroleum

Geological Survey of Western Australia

SCALE 1:750 000

ALBERS EQUAL AREA PROJECTION WITH CENTRAL MERIDIAN 121° AND STANDARD PARALLELS 17°30' AND 31°30'

HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUSTRALIA 1984 (GDA84)

GDA

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