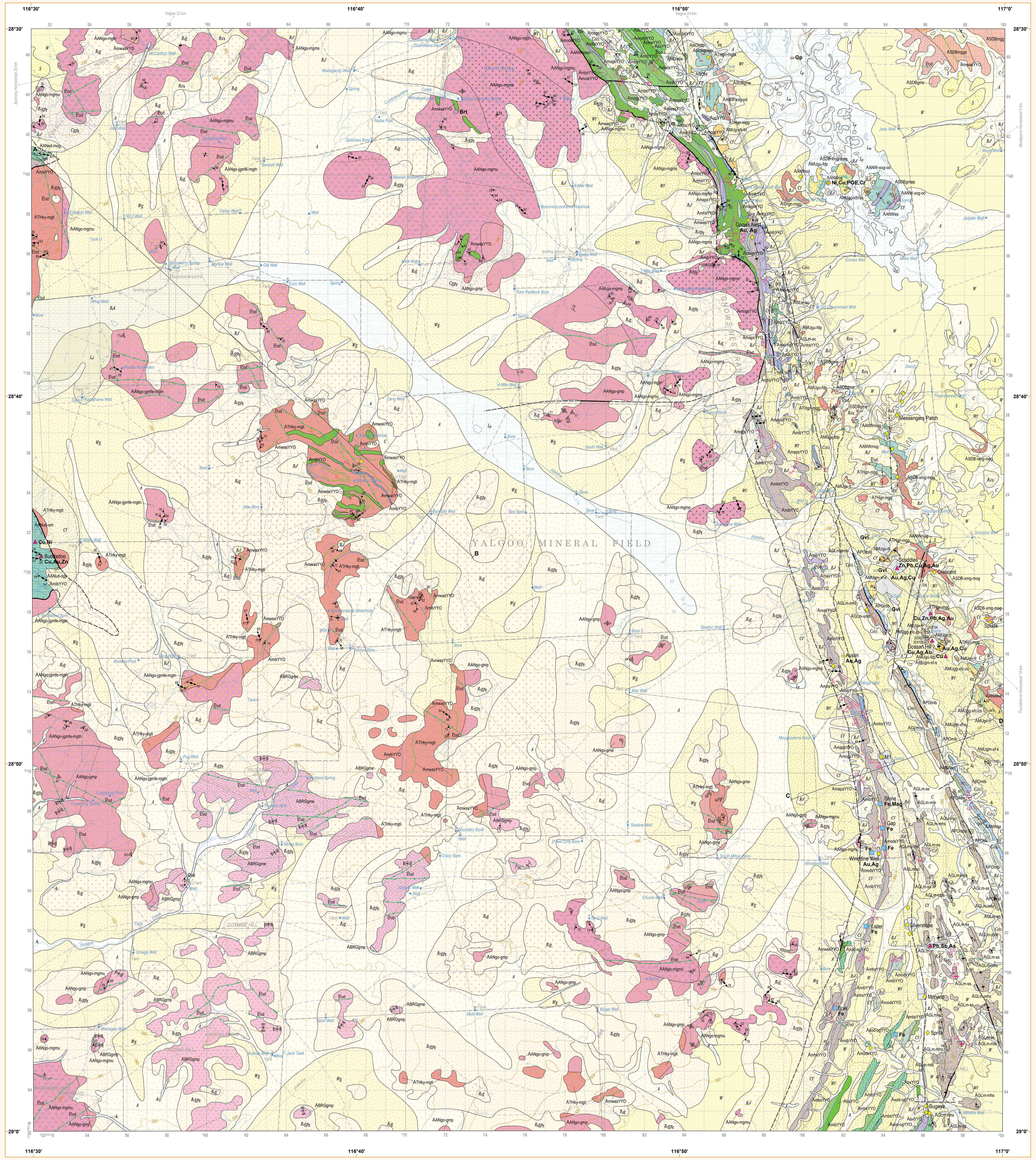
AUSTRALIA 1 : 100 000 GEOLOGICAL SERIES

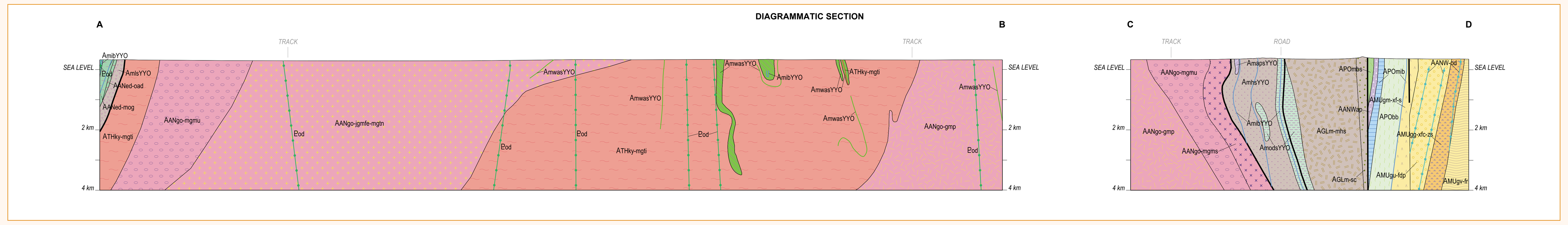
BADJA

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

SHEET 2240



DIAGRAMMATIC SECTION



Colluvial units

C	Colluvium derived from different rock types; includes gravel, sand, and silt
Cf	Colluvial footslope containing ferruginous gravel and reworked ferruginous duricrust
C_tc_i	Talus from banded iron-formation and chert; locally cemented
Cf	Ferruginous gravel and reworked ferruginous duricrust
Cgp_g	Quartzofeldspathic gravel, sand, and silt commonly derived from granitic rocks, their metamorphosed equivalents, and associated weathering products

Sheetwash units

W	Clay, silt, and sand in extensive fans; local ferruginous gravel
Wfq	Clay, silt, and sand with abundant vein-quartz pebbles on sheetflood fan
Wf	Clay, silt, and sand with abundant ferruginous grit
Wg	Clay, silt, and sand sheetwash deposits, commonly derived from granitic rock
Wq	Clay, silt, and sand sheetwash deposits with abundant quartz-vein debris

Alluvial units

A	Clay, silt, sand, and gravel in channels and on floodplains
A_a	Clay, silt, sand, and gravel on alluvial plains
A_c	Clay, silt, sand, and gravel in fluvial channels

Lacustrine units

L_d	Sand, silt, and gypsum in dunes adjacent to and within playa lakes
L_m	Mixed dunes, evaporite, and alluvial deposits; typically adjacent to playa lakes
L_p	Saline and gypsiferous evaporite deposits, clay, silt, and sand in playa lakes

Sandplain unit

S	Residual and eolian sand with minor silt and clay; low vegetated dunes locally common

Residual or relict units

R_rf	Ferruginous duricrust, massive to rubbly; includes iron-cemented reworked products
R_rgp_g	Undivided residual or relict material; mainly ferruginous and quartzofeldspathic duricrust over deeply weathered granite; minor kaolinized rock; includes mottled and leached zones of weathering profile
R_rz	Silcrete
R_rzp_g	Silcrete commonly derived from granite
R_sf	Residual sand and minor gravel derived from ferruginous duricrust
R_sg	Quartzofeldspathic sand, commonly over granite
R_sgp_g	Quartzofeldspathic sand and minor silcrete over granite; sparse granite outcrop; includes mottled and leached zones of weathering profile
R_sk	Residual sand and calcrete; nodular and pisolitic
R_ic_k	Weathered rock dominated by kaolin and quartz; protolith uncertain
Rd	Undivided residual or relict material; mainly ferruginous and siliceous duricrust; minor calcrete and kaolinized rock

PROTEROZOIC

Ꝑod	Dolerite dyke, sill, or plug; fine- to medium-grained dolerite and gabbro
zq	Quartz vein or pod; massive, crystalline, or brecciated; age uncertain

ARCHEAN

Bald Rock Supersuite — Walganna Suite (2647–2600 Ma)

ABRGgme	Equigranular monzogranite with 4–10 mm grain size
ABRGgmp	K-feldspar-porphyritic to megacrystic monzogranite; locally with biotite up to 10%

AmhsYYO	Interlayered psammite and pelite; schistose
AmlsYYO	Pelite; dominantly metashale and metasiltstone; local andalusite and/or cordierite porphyroblasts
AmibYYO	Metamorphosed banded iron-formation and minor banded chert
AmwasYYO	Strongly foliated amphibolite and amphibolite schist; fine to medium grained; commonly lineated
AmodsYYO	Metadolerite; schistose; locally amphibolitic
AmogsYYO	Strongly foliated metagabbro
AmbsYYO	Mafic schist derived from fine-grained mafic rocks
AmapsYYO	Chlorite–tremolite(–talc) schist derived from peridotite
AmaxYYO	Metapyroxenite, medium-grained; deeply weathered
AmusrYYO	Tremolite–chlorite(–talc) schist; includes minor metamorphosed komatiitic basalt, metapyroxenite, and cumulate-textured zones
Axs-bbYYO	Sedimentary and basaltic rocks, with minor chert and banded iron-formation; metamorphosed; commonly deeply weathered
AccbYYO	Banded chert and ferruginous banded chert; includes minor banded iron-formation and quartzite; metamorphosed
Axod-ogYYO	Massive dolerite interleaved with minor gabbro; metamorphosed
AbbYYO	Basalt, metamorphosed; includes some amphibolite and amphibolitic schist derived from tholeiitic basalt; may contain some metamorphosed high-Mg basalt, and minor mafic intrusive and volcaniclastic sedimentary rocks
AbbwYYO	Variolitic basalt; locally basalt and/or pyroxene spinifex-textured basalt; metamorphosed
AbsYYO	Komatiitic basalt, commonly with pseudomorphed pyroxene-spinifex texture; metamorphosed and locally schistose; includes weakly metamorphosed tholeiitic basalt and minor mafic and ultramafic intrusive rocks
AaxYYO	Pyroxenite; medium- to coarse-grained; massive to weakly foliated; metamorphosed
AupYYO	Peridotite, metamorphosed; commonly serpentinized

Murchison Supergroup

Glen Group (2735–2700 Ma; <2809 Ma[1])

MOUGOODERRA FORMATION

AGLm-mhs	Schistose pelite and psammite; includes metamorphosed shale and siltstone
AGLm-mtq	Quartzite and metamorphosed quartz-rich sandstone
AGLm-ss	Sandstone, siltstone, and local conglomerate; metamorphosed
AGLm-smb	Conglomerate, metamorphosed and strongly foliated; contains mafic and granitic clasts
AGLm-sc	Conglomerate, pebbly sandstone, and sandstone; locally silicified; metamorphosed
AGLm-mib	Metamorphosed banded iron-formation and minor banded chert; typical granular texture with magnetite and quartz grains 0.5 to 1.5 mm in size

Polelle Group (2800–2735 Ma)

APOmib	Metamorphosed banded iron-formation and minor banded chert; typical granular texture with magnetite and quartz grains 0.5 to 1.5 mm in size
APOmbs	Mafic schist with minor ultramafic schist; typically actinolite–tremolite–chlorite; locally strongly sheared
APObbd	Pillowed and spherulitic basalt with spherules locally abundant and up to 15 mm in diameter; metamorphosed
APObb	Fine to very fine grained basalt; locally moderately foliated; metamorphosed

Norie Group (2825–2800 Ma)

ANOmib	Metamorphosed banded iron-formation locally with recrystallized quartz and magnetite; typically moderately deformed
ANOmbs	Mafic schist derived from volcanic rock; locally preserved relict pyroxene-spinifex texture
ANOfrt	Moderately well-bedded volcaniclastic sandstone to siltstone of rhyolitic to dacitic affinity; metamorphosed

	AMUg-xfr-fd	**GOSSAN HILL FORMATION:** felsic volcanic and volcaniclastic rocks, rhyolitic to dacitic in composition; locally with economic massive sulphide mineralization; metamorphosed
c. 2947 Ma	AMUgm-xf-s	**Minjar Member:** felsic volcaniclastic rocks and fine-grained siliciclastic sedimentary rocks; minor amygdaloidal basalt; metamorphosed
c. 2962 Ma	AMUgu-fdp	**Scuddles Member:** porphyritic dacite with lesser rhyodacite and felsic volcaniclastic units; locally with economic sulphide mineralization; metamorphosed
c. 2963 Ma	AMUgg-xfc-zs	**Golden Grove Member:** rhyodacite, rhyolite and laminated felsic volcaniclastic rocks; host to economic massive sulphide horizons; metamorphosed
c. 2959 Ma	AMUgv-fr	**Gossan Valley Member:** quartz-porphyritic rhyolite and felsic volcaniclastic rocks; metamorphosed

Austin Downs Supersuite — Big Bell Suite (2735–2690 Ma)

ASDBmgg	Metagranodiorite; typically moderately foliated and weakly schistose
ASDBmggs	Schistose granodiorite; locally strongly sheared
ASDBgmap	Fine-grained monzogranite, commonly as dykes in greenstones; quartz(–feldspar)-porphyritic to locally equigranular; locally schistose
ASDBgme	Monzogranite to syenogranite; undeformed, locally with magmatic foliation
ASDB-xmg-mog	Metagranite to metagranodiorite with locally abundant decametre to hectometre scale rafts of metagabbro; locally foliated

Annean Supersuite

Rothsay Suite (c. 2749 Ma)

GOONETARRA GRANODIORITE

AANgo-mgms	Foliated biotite metamonzogranite, with local K-feldspar phenocrysts
AANgo-mgmu	K-feldspar megacrystic biotite metamonzogranite; commonly strongly foliated
AANgo-mgtn	Fine-grained, layered biotite tonalite gneiss; includes crosscutting younger phases and pegmatites
AANgo-jgmfe-mgtn	Equigranular monzogranite to syenogranite; common magmatic foliation; commonly contains rafts of migmatitic tonalite
AANgo-gme	Equigranular monzogranite to syenogranite; undeformed, locally with magmatic foliation
AANgo-gmp	K-feldspar-porphyritic to megacrystic monzogranite; common magmatic foliation

EDAMURTA GABBRO (c. 2795 Ma)

AANed-mog	Metagabbro, typically deformed with greenschist to amphibolite facies assemblages; locally with relict igneous texture; locally garnet-bearing
AANed-oad	Anorthosite to leucogabbro with distinctive euhedral plagioclase megacrysts up to 20 mm long; metamorphosed

Warriedar Suite (2801–2793 Ma)

AANWmog	Metagabbro; locally with layers of metaleucogabbro, metagabbronorite, metadolerite and minor metapyroxenite; includes amphibole-porphyroblastic metagabbro and metadolerite; typically weakly schistose
AANW-xog-od	Interlayered gabbro and dolerite; metamorphosed
AANWod	Dolerite; metamorphosed
AANWog	Gabbro; locally includes layers of leucogabbro, gabbronorite, dolerite, minor pyroxenite and pegmatitic gabbro; metamorphosed
AANWmasr	Ultramafic talc–tremolite–serpentine–magnetite schist; locally strongly sheared
AANWax	Pyroxenite; relict cumulate textures preserved locally; minor peridotite; metamorphosed; typically serpentinized
AANWap	Peridotite; relict cumulate textures preserved locally; minor pyroxenite; metamorphosed; typically serpentinized

Meeline Suite (c. 2813 Ma)

AANud-ogy	**BUDDADOO GABBRO:** layered gabbroic rocks with distinctive magnetitite horizons and minor diorite; metamorphosed
AANud-am	Magnetitite layers up to 1 m thick comprising 15 mm magnetite crystals interlayered with leucogabbro with 5–10 mm grain size; metamorphosed

Thundellara Supersuite

Bunnawarra Suite (c. 2950 Ma)

ATHky-mgti	**KYNEA TONALITE:** migmatitic tonalite (to granodiorite) gneiss with metamonzogranitic leucosomes

(c. 2951 Ma)

ATHgn-mgg	**GNOWS NEST GRANODIORITE:** metamorphosed granodiorite to tonalite with K-feldspar phenocrysts up to 8 mm in 4–6 mm matrix
ATHgn-mgta	Metamorphosed tonalite to granodiorite with hornblende and K-feldspar phenocrysts up to 8 mm in 4–6 mm matrix

Murchison Domain — Youanmi Terrane — YILGARN CRATON

Geological boundary
- exposed

Fault or shear zone
- exposed
- normal, exposed, tick on downthrown side
- concealed
- normal, concealed, tick on downthrown side
- thrust, concealed, triangle on upthrown side

Fold, showing axial trace
- syncline, exposed

Small-scale fold axial surface, showing strike and dip
- inclined (80)
- vertical

Small-scale fold axis, showing trend and plunge
- inclined (60)
- vertical
- syncline (70)
- antiform (70)
- S-vergence (45)
- M-vergence (80)
- Z-vergence (78)

Bedding, showing strike and dip
- inclined (75)
- vertical
- overturned, inclined (66)
- way-up not known, inclined (66)

Igneous contact, showing strike and dip
- inclined (36)

Igneous layering, showing strike and dip
- inclined (75)
- vertical

Way-up indicator
- sedimentary structure
- graded bedding
- fining upwards sequence

Magmatic foliation, showing strike and dip
- inclined (70)
- vertical
- dip indeterminate

Metamorphic foliation, showing strike and dip
- inclined (88)
- vertical
- dip indeterminate

Gneissic layering, showing strike and dip
- inclined (70)
- vertical

Cleavage, showing strike and dip
- inclined (80)
- vertical

Crenulation cleavage, showing strike and dip
- inclined (68)
- vertical

Lineation, unspecified, showing trend and plunge
- inclined (55)

Mineral lineation, showing trend and plunge
- inclined (70)

Stretching lineation, showing trend and plunge
- inclined (73)

Magmatic lineation, showing trend and plunge
- inclined (80)
- vertical

Fracture pattern

Trend line
- interpreted from aeromagnetic data

Isotopic age determination site with identification number — 155879

Purple point structure symbols signify measurements of bedrock features preserved in residual regolith units (R_rgp_g)

Road, sealed
Road, unsealed
Track
Fence
Powerline
Conveyor
Homestead — Badja
Yard — Yard
Horizontal control; major, minor

Breakaway
Ridge
Sand dune crest
Contour line, 20 metre interval — 400

Watercourse with ephemeral pool
Lake
Pool — Pool
Rockhole — Rockhole
Waterhole — Waterhole
Spring — Spring
Pipeline — pipeline
Drain — drain
Bore, well — Bore, Well
Windpump
Dam, tank — Dam, Tank

Opencut or quarry
Made ground or mining area
Tailings or stockpile

MINERAL SITES

MINERALIZATION STYLE
- Porphyry, pegmatite, greisen, and skarn
- Orthomagmatic mafic and ultramafic
- Vein and hydrothermal
- Stratabound volcanic and sedimentary
- Stratabound sedimentary and/or sedimentary banded iron-formation
- Regolith hosted
- Unknown/unassigned

COMMODITY GROUP
- Precious metal
- Steel alloy metal
- Base metal
- Iron
- Industrial mineral
- Construction material

All precious metal sites are gold unless otherwise indicated

COMMODITY

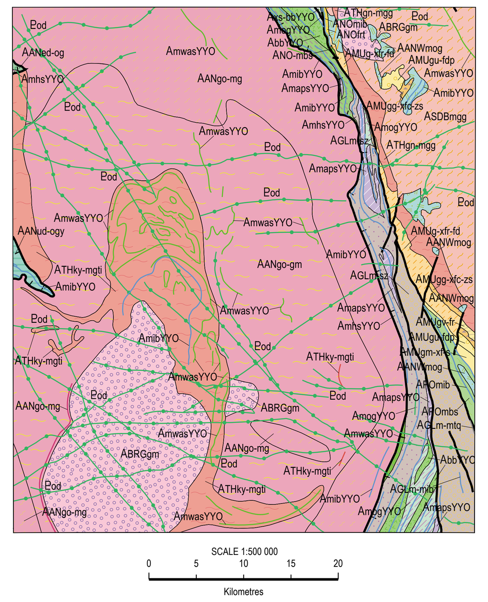
Antimony	Sb
Arsenic	As
Barite	Brt
Chromium	Cr
Copper	Cu
Gold	Au
Gravel	Gvl
Gypsum	Gp
Iron	Fe
Lead	Pb
Magnetite	Mag
Nickel	Ni
Platinum Group Elements	PGE
Silver	Ag
Zinc	Zn

SITE NAME

Mine, deposit, prospect, or occurrence....... Scuddles

Mineralization sites on this map have been extracted from GSWA's MINEDEX database. For clarity, names have been shown only for selected sites. Full details of site numbers, site locations, site status, mineralization, and commodities can be obtained from the MINEDEX database, accessed at <www.dmp.wa.gov.au/minedex>.

INTERPRETED BEDROCK GEOLOGY



For further details refer to main legend

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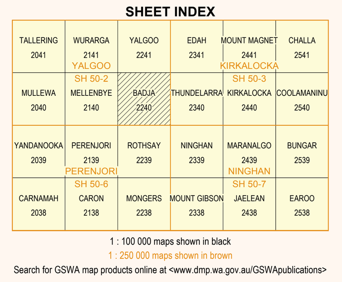

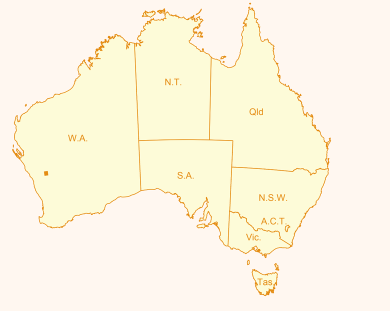

DATA SOURCES

Theme	Data Currency	Organization†
Geology *	2016	Geological Survey of Western Australia, Department of Mines and Petroleum
Mineral sites *	Mar 2016	Geological Survey of Western Australia, Department of Mines and Petroleum
Structural data	Mar 2016	Geological Survey of Western Australia, Department of Mines and Petroleum
Horizontal control	Mar 2016	Landgate
Topography	2013	Landgate
Contours	2006	Geological Survey of Western Australia, Department of Mines and Petroleum (derived from NASA SRTM 90 m Digital Elevation Model)

* DMP data can be viewed interactively via GeoVIEW.WA <www.dmp.wa.gov.au/geoview> and related datasets can be downloaded from the GSWA Data and Software Centre <www.dmp.wa.gov.au/datacentre>

† WA State Government unless otherwise indicated

Compiled by I Zibra, TJ Ivanic, SF Chen, F Clos, J Li, P Gu, Y Meng, J Yu and C Wang 2012–15

Geology by I Zibra, TJ Ivanic, SF Chen, F Clos, J Li, P Gu, Y Meng, J Yu and C Wang 2012–15

Regolith by I Zibra 2015–16

Explanatory Notes for units and events are available online at <www.dmp.wa.gov.au/ENS>.

Geochronology from GSWA data (published and in preparation) and interpreted from external sources (listed below). Some GSWA geochronology may come from samples obtained on adjoining map sheets. GSWA geochronology data are available online at <www.dmp.wa.gov.au/geochron>.

External geochronology by:
(1) Wang, et al. 1998: Australian Journal of Earth Sciences, v. 45, p. 571–577.

Cartography by PJ Backhouse

Edited by B Striewski, SR White and K Greenberg

Published by Geological Survey of Western Australia

This map is published in digital format (PDF) and is available online at <www.dmp.wa.gov.au/GSWApublications>.
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The recommended reference for this map is:
Zibra, I, Ivanic, TJ, Chen, S, Clos, F, Li, J, Gu, P, Meng, Y, Yu, J and Wang, C, 2016, Badja, WA Sheet 2240: Geological Survey of Western Australia, 1:100 000 Geological Series.

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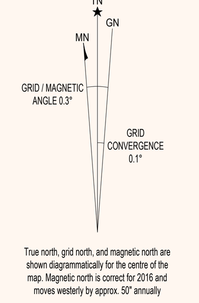

China Geological Survey

Government of Western Australia
Department of Mines and Petroleum

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SCALE 1 : 100 000

1000 0 1 2 3 4 5 6 7 8 9 10
Metres Kilometres

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUSTRALIA 1994
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM

Grid lines indicate 1000 metre interval of the Map Grid Australia Zone 50

The Map Grid Australia (MGA) is based on the Geocentric Datum of Australia 1994 (GDA94)
GDA94 positions are compatible within one metre of the datum WGS84 positions

BADJA

SHEET 2240 FIRST EDITION 2016

Version 1 — June 2016

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