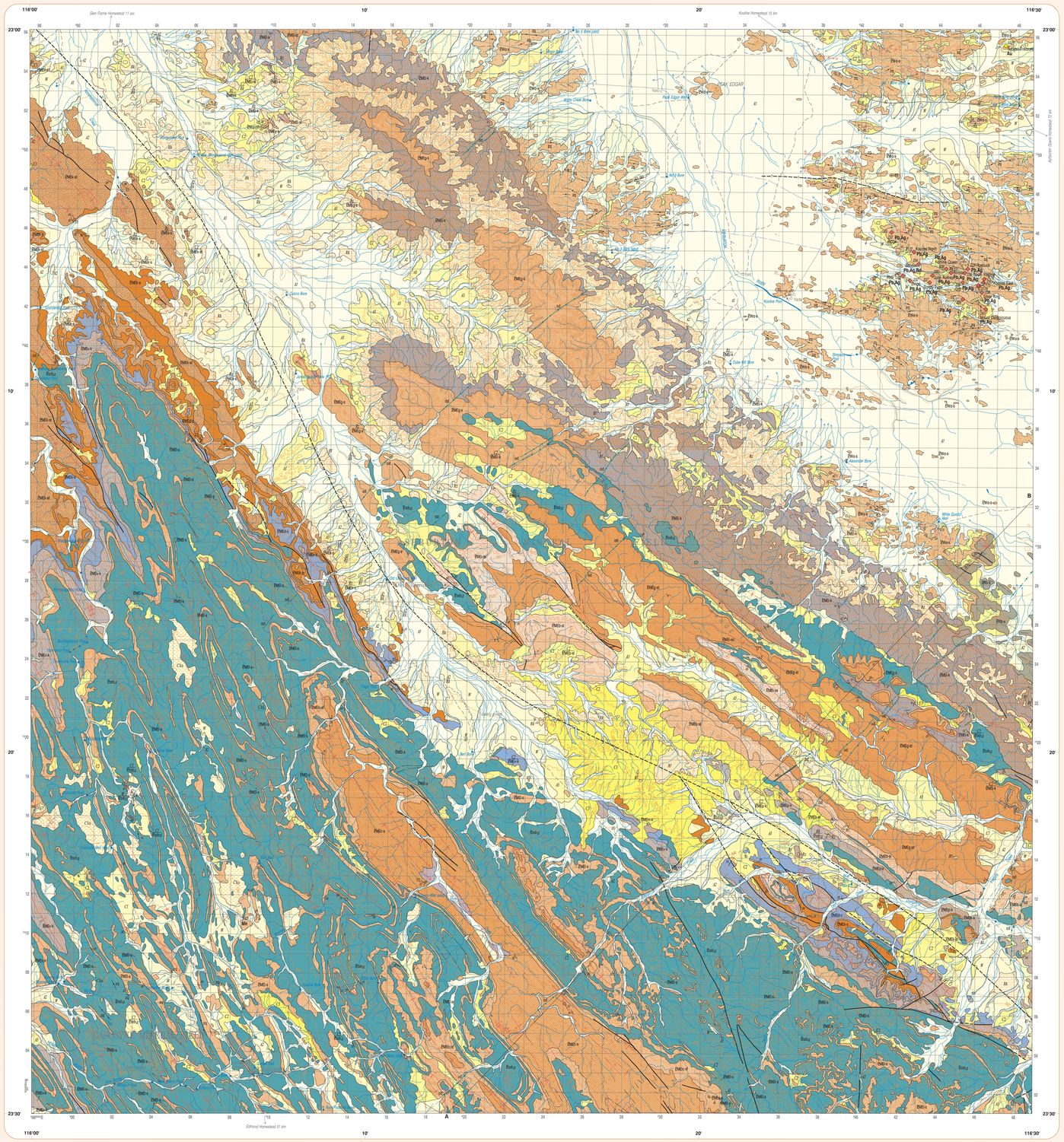
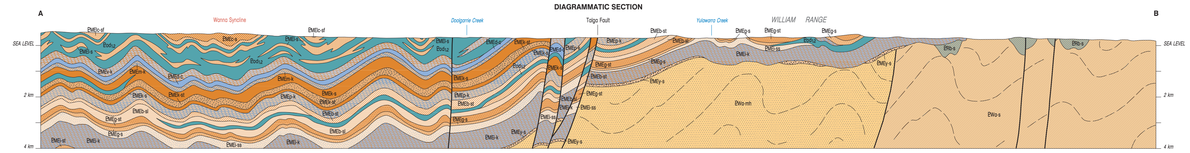
ULLAWARRA

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA



DIAGRAMMATIC SECTION



SHEET INDEX

1:100 000 maps shown in black

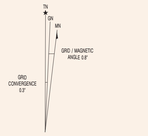
1:250 000 maps shown in brown

Geology by D. B. Seymour and A. M. Thorne 1982–83, and I. A. Copp and D. McB. Martin 1998, and D. McB. Martin and A. M. Thorne 2001

Geochronology by:
(1) M. T. D. Wingate and J. W. Giddings, 2000, Precambrian Research, v. 100, p. 335–357.
(2) M. T. D. Wingate, 2002, GSWA Record 2002/4.
(4) D. R. Nelson, 2001, GSWA Record 2001/2, p. 10–20.
(5, 7) R. Nelson, 1998, GSWA Record 1998/3, p. 194–197.
(6) C. E. Hall *et al.*, 2001, Australian Journal of Earth Sciences, v 48, p. 731–744.
(7) GSWA, in prep., GSWA Record.
(8) K. N. Sircombe, 2003, Australian Journal of Earth Sciences, v. 50, p. 967–974.
Interpreted geochronology by:
(3) D. McB. Martin and A. M. Thorne, 2004, Precambrian Research, v. 128, p. 385–409.
Edited by F. Eddison and G. Lyon
Cartography by S. Coldicott and A. Pronosio

Published by the Geological Survey of Western Australia. Digital and hard copies of this map are available from the Information Centre, Department of Industry and Resources, 100 Plain Street, East Perth, WA, 6004. Phone (08) 9222 3459. Fax (08) 9222 3444. Web: www.doir.wa.gov.au/gswa Email: geological.survey@doir.wa.gov.au

The recommended reference for this map is:
COPP, I. A.; THORNE, A. M.; MARTIN, D. McB.; and BAGAS, L., 2004, Ullowarra, W. A. Sheet 2151: Western Australia Geological Survey, 1:100 000 Geological Series



True north, grid north and magnetic north are shown diagrammatically for the centre of the map. Magnetic north is correct for 2004 and moves easterly by about 0.1° in 1 year.

PHANEROZOIC

CAINOZOIC

QUATERNARY

Unassigned

W *L*

Sheetwash unit
W Sandy and clayey distal sheetwash and slope deposits, no clearly defined drainage

Lacustrine unit
L Unconsolidated fine-grained deposits in playpans, perennial lakes, and swamps; lake-lying areas with internal drainage; typically thickly vegetated

Cl *Clg* *Clr* *Al* *Alc* *Alr*

Colluvial units, third generation
Cl Quartz and rock fragments in an unconsolidated silt and sand matrix; includes ferruginous deposits
Clg Swelling clay (gilgai) and rock fragments, mostly developed over dolerite
Clr Unconsolidated ferruginous rubble and scree

Alluvial units, third generation
Al Unconsolidated silt, sand, and gravel in active drainage channels; includes ferruginous deposits
Alc Clayey colluvium developed on alluvial flats
Alr Unconsolidated ferruginous silt, sand, and gravel

C2 *A2*

Colluvial unit, second generation
C2 Quartz and rock fragments in a partly consolidated silt and sand matrix

Alluvial unit, second generation
A2 Partly consolidated silt, sand, and gravel; partly dissected by present-day drainage

C3 *A3*

Colluvial units, first generation
C3 Quartz and rock fragments in a weakly cemented and compacted silt and sand matrix; deeply dissected valley-fill deposits

Alluvial units, first generation
A3 Weakly cemented and compacted silt, sand, and gravel; deeply dissected by present-day drainage

Rf *Rk* *Rz*

Residual or relict units
Rf Ferruginous deposits, including lateritic, ferruginous, and manganiferous duricrust
Rk Calcrete, developed in and adjacent to alluvial channels; locally silicified; dissected by major present-day drainage lines
Rz Silcrete and brecciated silceous caprock

zq Quartz veins, of various ages

od Dolerite dykes, sills, and small intrusions, of various ages; one suite dated at c. 755 Ma[1]; includes minor quartz diorite, tonalite, and biotite monzogranite

PROTEROZOIC

PALAEOPROTEROZOIC — MESOPROTEROZOIC

Edmundian Orogeny (1070–755 Ma[2])

Bangemall Supergroup — Collier Group (COLLIER BASIN)

BACKDOOR FORMATION
Thin- to thick-bedded dolomitic siltstone, dolarenite, and siltstone

Ebdu-d Dolerite and gabbro sills intruded into **Edmund Group**; oldest suite (*Ebdu*) dated at c. 1465 Ma[3,4]; and youngest suite (*Ebdu*) dated at c. 1070 Ma[5,6]

Bangemall Supergroup — Edmund Group (EDMUND BASIN)

EMEs-c **COORDAROO FORMATION:** thin to very thick bedded lithic quartz sandstone; minor siltstone and mudstone
EMEs-sl **Curran Member:** siltstone and fine- to coarse-grained sandstone; locally intruded by dolerite sills; has gradational contacts with the underlying **ULLAWARRA FORMATION** and overlying **COODAROO FORMATION**
EMEs-s **ULLAWARRA FORMATION:** siltstone, fine-grained sandstone, dolostone, and chert; intruded by numerous dolerite sills (*Ebdu-p*)
EMEs-k **DEVIL CREEK FORMATION:** laminated dolostone and dolomitic siltstone; local thick-bedded dolorudite
EMEs-c **DISCOVERY FORMATION:** massive or laminated chert, silicified mudstone, and siltstone; local silicified sandstone and conglomerate
EMEs-sl Siltstone
EMEs-k **MUNTHARRA FORMATION:** thin- to thick-bedded dolostone and stromatolitic dolostone, and sandstone and siltstone
EMEs-s **KIANGI CREEK FORMATION:** siltstone, mudstone, and thin to very thick bedded quartz sandstone; minor dolostone and conglomerate
EMEs-sl Medium to very thick bedded quartz sandstone and siltstone
EMEs-k **CHEYNE SPRINGS FORMATION:** dolostone, dolarenite, dolorudite, mudstone, siltstone, and minor sandstone
EMEs-sl Medium- to thick-bedded sandstone and siltstone; locally sulfidic
EMEs-sl **BLUE BILLY FORMATION:** siltstone and mudstone; minor thin- to thick-bedded sandstone; locally sulfidic
EMEs-sl Medium- to thick-bedded sandstone and siltstone
EMEs-o **GOORAGOORA FORMATION:** fine- to coarse-grained sandstone and siltstone; minor conglomerate, dolostone, and dolomitic siltstone
EMEs-k **IRREGULLY FORMATION:** stromatolitic and non-stromatolitic dolostone, dolomitic siltstone, quartz sandstone, and conglomerate
EMEs-ss Sandstone and siltstone; minor dolostone
EMEs-sl Sandstone, conglomerate, siltstone, and dolostone
EMEs-sl Siltstone, sandstone, and dolostone
EMEs-y **YILGATHERRA FORMATION:** sandstone, siltstone, conglomerate, and dolostone

c 1820 Ma[3]

Capricorn Orogeny D_{1b}, D_{1d} (1805–1780 Ma)

Capricorn Group (BLIAR BASIN)

Ebb-s **BYWASH FORMATION:** thin to very thick bedded medium to very coarse grained sandstone, dolomitic sandstone, dolostone, dolorudite, dolarudite, and felsic volcanic rock

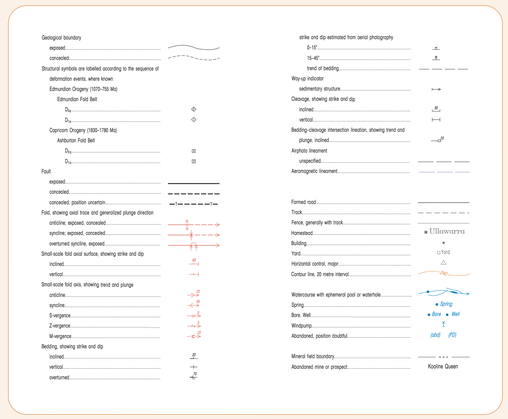
c 1804 Ma[4]

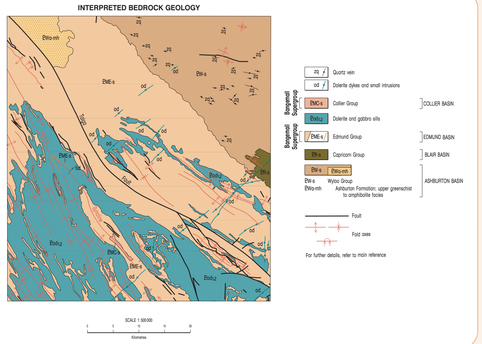
Capricorn Orogeny D_{1b} (*c.* 1805 Ma)

Wyloo Group (ASHBURTON BASIN)

Ebwo-s *Ebwo-mh*

ASHBURTON FORMATION
Ebwo-s Siltstone, thin to very thick bedded lithic quartz sandstone, pebble to cobble conglomerate, and felsic volcanic rock; lower greenschist facies
Ebwo-mh Interbedded pyammite and pelite; includes quartz-muscovite-biotite-cordierite-andalusite-garnet schist and quartz-muscovite-biotite-staurolite schist; upper greenschist to amphibolite facies





MINERAL OCCURRENCES

MINERALIZATION STYLES
- Vein and hydrothermal
- Stratabound sedimentary

MINERAL AND ROCK COMMODITY GROUPS
- Precious metal
- Base metal
- Steel industry metal

MINERAL AND ROCK COMMODITIES

Barite	Brt
Gold	Au
Lead	Pb
Manganese	Mn
Silver	Ag

OPERATING STATUS AND SITE IDENTIFICATION NUMBER

Abandoned mine	e.g. 233
Mineral occurrence or prospect	e.g. 242

Mineral occurrences and numbers are from the GSWA MWAIN database

DATA DIRECTORY

Theme	Data Source	Data Currency	Agency
Geology	GSWA	1998–2004	Dept of Industry and Resources
Structural data	WARCK	NOV 2003	Dept of Industry and Resources
Mineral occurrences (non-confidential)	MINEDEX	JUN 2004	Dept of Industry and Resources
	MWAIN	JUN 2004	Dept of Industry and Resources
Cadastre	TENGRAPH	APR 2004	Dept of Industry and Resources
Horizontal control	GEOMAR	MAY 2004	Dept of Land Information
Topographic nomenclature	GEONOMA	APR 2004	Dept of Land Information
Topography	DLI and GSWA field survey	2001	Dept of Land Information

Department of Industry and Resources
CLIVE BROWN, M.L.A.
MINISTER FOR STATE DEVELOPMENT
JIM LIMERICK
DIRECTOR GENERAL

Geological Survey of Western Australia
TIM GRIFFIN
DIRECTOR

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

GDA

ULLAWARRA

SHEET 2151 **FIRST EDITION 2004**

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