SYMBOLS

Geological boundary
- observed
- concealed or gradational facies boundary

Fault
- exposed
- concealed
- normal, tick on downthrown side, showing dip
- thrust, triangle on upthrown side

Fold or bothem, showing axial trace
- anticline or bothem axis, exposed
- synclne, exposed

Bedding
- inclined, showing strike and dip
- trend from aerial photography

Paleocurrent direction

Asphalts treatment

Neptunian dyke or major joint

Formed road, bridge

Track

Aboriginal Community — Windjingoy Community

Homestead — Napier Downs

Aboriginal name — Quiangmeri

Building

Yard

National Park boundary

Horizontal control, mirror

Watercourse

Spring — S

Bore, well — B, W

Windpump — T

Tank — T

Abandoned — (abd)

Petroleum exploration well
- dry, abandoned — Napier 5

Opencut, abandoned — Russell

Quarry or pit

Prospect

Mineral occurrence
- Building stone — Bs
- Garnet — Grt
- Lead — Pb
- Rock material — Rm
- Zinc — Zn

REFERENCE

Qa	Qb	Qk	Qs

CAINOZOIC

QUATERNARY

Qa Alluvial deposits — reddish sand, gravel and clay in channels and floodplains
Qb Black-soil deposits — black clayey gilgai soil
Qk Calcrete and tufa
Qs Sandplain deposits — unconsolidated eolian and residual sands; minor silt and clay; includes low vegetated dunes

TERTIARY

MIOCENE

Czd Duricrust — siliceous and ferruginous deposits

Ti **WITCH VOLCANICS:** lamprolite diatremes and associated pyroclastic rocks, largely or entirely covered by Quaternary soils

PALAEOZOIC

PERMIAN

Pl **LIVERINGA GROUP:** well-bedded, shallow-marine to fluvial sandstone and siltstone; ferruginous in port

Pg **GRANT GROUP:** crudely bedded marine sandstone and siltstone; in port glorygene

CARBONIFEROUS

TOURNAISIAN

DCF **FAIRFIELD GROUP:** shale, sandstone, and fossiliferous limestone

FAMENNIAN

Dw **WINDJANA LIMESTONE:** *reef-margin subfacies:* massive, microbial reef limestone; locally dolomitized; commonly with many neptunian dykes

+ Dwc Large allochthonous blocks of **WINDJANA LIMESTONE (reef)** in fore-reef subfacies

Dl **NULLARA LIMESTONE:** *back-reef subfacies:* well-bedded, fenestral, oolitic, and pelloidal limestone; locally dolomitized, sandy, and conglomeratic

FRASNIAN reef FAMENNIAN

Dn **NAPIER FORMATION:** *reefal-slope, fore-reef, and basinmal subfacies*

Dnc Famennian well-bedded to massive reefal-slope and fore-reef limestone; locally dolomitized and steeply dipping; locally microbial and sponge rich; some allochthonous blocks and debris flows; some sandstone and conglomerate

Dne Frasnian and Famennian deep-water bioherms: stromatolite and *Receptaculites* sponge limestone; locally dolomitized

Dnr Frasnian well-bedded to massive reefal-slope and fore-reef limestone, locally dolomitized and steeply dipping; locally microbial and sponge rich; some allochthonous blocks and debris flows; some sandstone and conglomerate

FRASNIAN

Dp **PILLARA LIMESTONE:** *platform facies, undivided;* mainly *back-reef* and lesser *reef-flat subfacies:* white to light-grey and yellow, medium-bedded, stromatoporoid and lenestrid limestone; locally dolomitized, sandy and grading into calcareous sandstone; commonly forming shallowing-upward cyclic sequences

Dpr *Reef-margin and reef-flat subfacies:* white to light-grey and yellow, massive to thick-bedded stromatoporoid and microbial reef limestone; locally dolomitized

+ Dpc Large allochthonous blocks of **PILLARA LIMESTONE (reef)** in fore-reef subfacies

Detrital reef complexes

FRASNIAN reef FAMENNIAN

Dcv **VAN EMMERICK CONGLOMERATE:** siliciclastic conglomerate and sandstone; alluvial-cone, fan-delta, and submarine-fan deposits. Extends into Gneiss in subsurface

Dcvu Upper Van Emmerick Conglomerate (probably Famennian)

FRASNIAN reef FAMENNIAN

Dcb **BOHN CONGLOMERATE:** siliciclastic conglomerate and sandstone; alluvial-cone, fan-delta, and submarine-fan deposits

GIVETIAN

Dn **POULTON FORMATION:** sandstone, shale, and siltstone; minor dolomite; marine (section only)

Devonian conglomerates

PROTEROZOIC

NEOPROTEROZOIC

PALAEOPROTEROZOIC

Pr Proterozoic rock, undivided (sections and stratigraphic relationships diagram)

810–810 Ma — Ehu Sedimentary rock

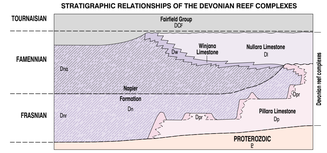
1635–1790 Ma — Ew Sedimentary rock and diorite

1885–1850 Ma — Eg Granitoid rock

c. 1850 Ma — Ew **WHITEWATER VOLCANICS:**

1870–1840 Ma — Eh Metamorphic rock

STRATIGRAPHIC RELATIONSHIPS OF THE DEVONIAN REEF COMPLEXES



SHEET INDEX

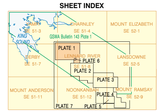


Plate 1-7 shown in black
1:100 000 maps shown in brown

Project map shown in green

See current GSWA map catalogue for full range of published maps

Compiled by R. M. Hocking and P. E. Playford

Devonian geology by P. E. Playford, 1961–1995, R. M. Hocking, 1993–1995, D. C. Lowry, 1961–1962, and M. B. Ward, 1985–1986

Precambrian geology modified from Griffin and Tyler, 1986

Edited by N. Tetlow, D. Ferdinando, F. Apodopoulos, C. Brien, and G. Loon

Cartography by E. Green, S. Cosbourt, T. Lemme, and K. Greenberg

Topography from the Department of Land Administration with modifications from geological field survey

Published by the Geological Survey of Western Australia. Copies available from the Information Centre, Department of Minerals and Energy, 100 Plain Street, East Perth, WA, 6004. Phone (08) 9222 3459, Fax (08) 9222 3444

This map is also available in digital form

Printed by the Sands Print Group, Western Australia

True north, grid north and magnetic north are shown diagrammatically for the centre of the map. Magnetic north is correct for 1998 and moves easterly by about 0.1° in 6 years

DIAGRAMMATIC SECTIONS

NATURAL SCALE (MAP SCALE x 2)

SCALE 1:50 000

1000 0 1 2 3 4 Metres Kilometres

SCALE 1:100 000

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

TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM: AUSTRALIAN GEODETIC DATUM 1984
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM

Grid lines indicate 1000 metre interval of the Australia Map Grid Zone 51

DEPARTMENT OF MINERALS AND ENERGY
L. C. MAWORD, DIRECTOR GENERAL

GOVERNMENT OF WESTERN AUSTRALIA
HON. NORMAN MOORE, M.L.C.
MINISTER FOR MINES

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA
DAVID BLIGHT, DIRECTOR

NAPIER RANGE AREA

DEVONIAN REEF COMPLEXES OF THE CANNING BASIN

BULLETIN 145 PLATE 1

© Western Australia 1998