

## REGOLITH MATERIALS

### REFERENCE

- RESIDUAL (R)** - Residual sand, siltstone, and gravel derived from weathering in situ
- R1 comprising mainly iron-rich material (hematite)
  - R2 comprising mainly carbonate-rich material (authigenic limestone and calcareite) includes Nadara Formation
  - R3 comprising mainly mixed material (calcite and quartzite)
  - R4 comprising mainly silica-rich material (silicified)

- EXPOSED (X)** - Outcrop of saprock, bedrock, and outcrop with locally derived sand, silt, clay, and rubble
- X1a derived from quartzite/silicified metamorphic rock (igneous, schist, phyllite, and gneiss)
  - X1b derived from quartzite/silicified plutonic rock (granite, monzogranite, gneiss, and tonalite)
  - X1c derived from carbonate-rich sedimentary rock (Ordovician Precambrian and Phanerozoic Limestones, fossiliferous and quartzite in part)
  - X1d derived from carbonate-rich, glauconitic bioclastic sedimentary rock (lower Cambrian Calcareous)
  - X1e derived from carbonate-rich metamorphic rock (metamorphosed dolomite and marble)
  - X1f derived from heterogeneous sedimentary rock (quartzite, siltstone, shale, limestone, greenstone, and carbonaceous siltstone)
  - X1g derived from heterogeneous silicified glauconitic sedimentary rock (Lyons Group)
  - X1h derived from ferromagnesian hypabyssal rock (diabase)
  - X1i derived from ferromagnesian metamorphic rock (mafic schist, amphibolite and quartz-magnetite rock, and metamorphosed diorite, and gabbro)
  - X1j derived from quartz-rich rock (quartzite)
  - X1k derived from quartz-rich metamorphic rock (quartzite and thin calc-silicate rock)
  - X1l derived from quartz-rich silicified sedimentary rock (sandstone, siltstone, conglomerate, and wacke)
  - X1m derived from carbonaceous silicified sedimentary rock (black shale, siltstone, wacke, chert, and carbonaceous chert with silicified locally pyritic, includes black soil)
  - X1n derived from silica-rich bioclastic sedimentary rock (Mildura Radiolite)
  - X1o derived from silica-rich sedimentary rock (Discovery Formation of the Edmund Group)

- COLLUVIAL (C)** - Unconsolidated and semi-consolidated silt, sand, gravel, and rubble
- C1 comprising mainly iron-rich material
  - C2 derived mainly from quartzite/silicified rock
  - C3a derived mainly from quartzite/silicified metamorphic rock (igneous, schist, phyllite, and gneiss)
  - C3b derived mainly from quartzite/silicified plutonic rock (granite, monzogranite, gneiss, and tonalite)
  - C3c derived mainly from carbonate-rich rock (calcareous and limestone)
  - C3d derived from mixed rock types
  - C3e derived mainly from quartz-rich rock (siltstone, sandstone, conglomerate, and wacke)
  - C3f derived mainly from silica-rich rock (Mildura Radiolite)

- LOW-GRADIENT SLOPE (W)** - Sand- and clay-dominated colluvium and sheetwash
- W1 undisturbed
  - W2 containing abundant silica-rich material, terrigenous in part (commonly above shallow subzone of Mildura Radiolite)
  - W3 consolidated and indurated in part (silicified, calcareous)

- ALLUVIAL (A)** - Cobbles, gravel, sand, silt, and clay in alluvial channels and floodplains
- A1 undisturbed
  - A2 dominated by valley calcareous, silicified and indurated in part

- LACUSTRINE (L)** - Clay, silt, sand, gravel, and evaporitic material
- L1 in lakes and large playas
  - L2 in mixed dune and playa terrain
  - L3a in fingering bedded deposits, gypsum, anhydrite, and halite

- SANDPLAIN (S)** - Eolian and residual sand
- S1 in undulating sandplain, dunes locally developed
  - S2 in mixed sandplain, sheetwash, and playa terrain, dunes locally developed
  - S3 in mixed sandplain and colluvium and sheetwash

- EOLIAN (E)** - Eolian sand
- E1 in extensive longitudinal dune, terrain
  - E2 in mixed longitudinal dune, sheetwash, and playa terrain
  - E3a in recent coastal dunes, beaches, and beach ridges, derived in part from carbonate-rich material
  - E3b in degraded coastal dunes, derived in part from carbonate-rich material (calcareous)
  - E3c in degraded coastal dunes, derived in part from carbonate-rich material (quartzite, Bundera Calcareous)

- COASTAL (K)** - Old wave- and tide-dominated coastal, and marine deposits
- K1 derived mainly from carbonate-rich material (calcareous, calcareous, and coralline reefs, Bundera Calcareous)

- MARINE (M)** - Offshore marine deposits
- M1 derived mainly from carbonate-rich material (coralline reefs - Ningaloo Reef tract)

### SYMBOLS

- Regolith boundary
- Sand dune
- Highway
- Formed road
- Track
- Watercourse
- Permanent water
- Pool, spring, bore, well
- Homestead
- Locality
- Diatremes and intrusions
- Open-cut
- Prospect
- Mineral occurrence
- Barite
- Copper
- Gold
- Gypsum
- Lead
- Sand
- Uranium
- Zinc

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Topography from Australian Surveying and Land Information Group, and Department of Land Administration Sheets SF 50-13 and part SF 49-16

This map was compiled and produced using a Geographic Information System (ArcInfo), and the data are available in digital form

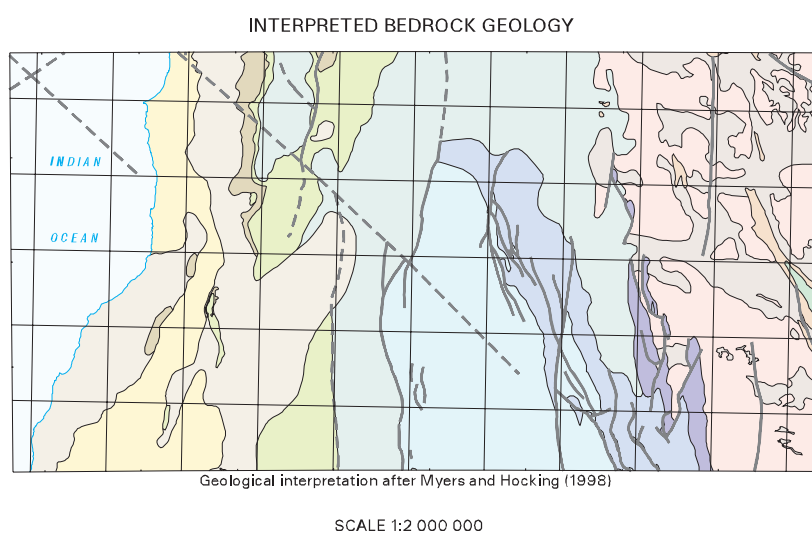
Published by the Geological Survey of Western Australia. Copies of this map, or extracts of the data, are available from the Information Centre, Department of Minerals and Energy, 100 Plain Street, East Perth, W.A., 6004. Phone (08) 9222 3469. Fax (08) 9222 3444

Compiled by A. J. Sanders 2000

Field observations 1989 by A. J. Sanders (GSWA) and E. Bousquet, J. Moore, R. Bousquet, E. Mousk, K. Nason, and J. Harrison

Compiled using various TM Images (1982 and 1985 data), 1976 black and white aerial photography published Geological Survey of Western Australia Geological Series map, Winning Pool - Minilya 1984, and field observations 1989

The recommended reference for this map is: SANDERS, A. J., 2001. Regolith materials, Winning Pool - Minilya, W.A. Sheet SF 50-13 and part sheet SF 49-16. In: Geological map of the Winning Pool - Minilya 1:250 000, sheets by A. J. SANDERS and S. A. MCGINNISSE. Western Australia Geological Survey, 1:250 000 Regolith Geochemistry Series Explanatory Notes, Plate 3



- PALEOZOIC QUATERNARY**
- SUNDERA CALCARENITE: siliceous, marine, and coastal within deposits; includes coastal lake deposits; commonly calcareous and gypsiferous
  - LAWSON SANDSTONE and TRESALLA LIMESTONE: marine limestone, and minor marine and continental sandstone
  - CARDABA CALCARENITE, GRALLA CALCARENITE, and MELUNBISH SANDSTONE: Marine limestone and sandstone, with minor siltstone and basal greenstone
  - TOOLONG CALCARENITE, KOROON CALCARENITE, and MIMBA FORMATION: Marine limestone, chert, mud, and greenstone, dominantly calcareous pelagic deposits with basal sandstone and conglomerate
  - Winning Group: Marine and coastal shale, siltstone, and radiolarite; dominantly siliceous pelagic deposits with basal sandstone and conglomerate
  - Woodward Group, Doyle Group, and Kennedy Group: Marine and continental siltstone, shale, and sandstone
  - Lyons Group and CALLYTHARRA FORMATION: Marine and continental siltstone, shale, sandstone, and limestone; glauconitic influenced
  - Marine to continental siltstone, shale, sandstone, and limestone; glauconitic influenced
  - Marine to continental limestone, dolomite, sandstone, siltstone, shale, and conglomerate
  - Dolerite sill
- EDWARD GROUP**
- Sandstone, siltstone, shale, dolomite, and chert; intruded by dolerite dykes and sills
- GEOSYNE COMPLEX**
- Granodiorite, monzogranite, granite, and pegmatite; includes minor diorite and gabbro
  - Schist, migmatite, gneiss, phyllite, quartzite, and minor calc-silicate rock, marble, and amphibolite (Murray Metamorphic Suite)
- PROTEROZOIC**
- Geological boundary
  - Fault, exposed
  - Fault, concealed or inferred

SCALE 1:250 000

UNIVERSAL TRANSVERSE MERCATOR PROJECTION  
HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUSTRALIA 1994  
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM  
Grid lines indicate 20 000 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



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MARLB SF 40-13	WINNIE POOL SF 50-13	EDWARD SF 50-14
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MARLB 1:100 000	HEALD 1:100 000	WINNIE 1:100 000	WILLOW 1:100 000

## REGOLITH MATERIALS

REGOLITH GEOCHEMISTRY SERIES

## WINNING POOL - MINILYA

SHEET SF 50-13, part SF 49-16

FIRST EDITION 2001

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