

Map Unit	GENERAL FEATURES	PHYSICAL PROPERTIES	SUBSIDIARY PROPERTIES	CURRENT PROCESSES	NOTES
Unconsolidated Material	<p><b>Rock 2</b></p> <p><b>PEATY CLAY</b> - dark grey and soft, variable organic content, variable quartz sand content, of lacustrine origin</p> <p><b>CLAYEY PEATY SAND</b> - grey to black quartz sand with variable organic content, minor clay, of lacustrine origin</p> <p><b>CALCAREOUS SAND</b> - white, fine to medium-grained, sub-rounded quartz and shell debris, of eolian origin</p> <p><b>CALCAREOUS SAND</b> - as S<sub>1</sub></p> <p><b>CALCAREOUS SAND</b> - white, medium-grained, rounded quartz and shell debris, well sorted, of eolian origin</p> <p><b>LIMESTONE</b> - pale yellowish brown, waxy cemented, friable, medium to coarse grained, sub-rounded quartz and shell debris, may have layers of very coarse broken shells or mineral sands, of eolian origin</p> <p><b>CALCAREOUS SAND</b> - as S<sub>1</sub>, modified by estuarine and marine processes</p> <p><b>CALCAREOUS SAND</b> - overlying estuarine silts - as S<sub>2</sub>, as a relatively thin layer over variable thick estuarine silts, grey clays, of estuarine and eolian origin</p> <p><b>SILT</b> - brownish grey, calcareous in part, soft, some fine sand and shell debris in places, minor clay content, of estuarine origin</p> <p><b>CALCAREOUS SILT</b> - dark greyish brown silts and minor clay, some organic matter, shells and shell fragments and limestone are locally common</p> <p><b>PEATY SAND</b> - grey to black, fine to medium-grained, moderately sorted quartz sand, slightly peaty, of lacustrine origin</p> <p><b>SILTY SAND</b> - strong brown, fine to medium-grained, quartz, variable silt content</p> <p><b>CLAYEY SANDY SILT</b> - pale brown, angular to rounded sand, low cohesion, of alluvial origin</p> <p><b>GRAVEL</b> - red-brown gravel set in a silty matrix overlying ironstone, cemented limonitic gravels and coarse sands, of alluvial origin</p> <p><b>IRONSTONE</b> - red-brown limonitic gravel cemented in a limonite quartz sand matrix, of alluvial origin</p> <p><b>SILTY SAND</b> - red-brown, fine to medium-grained, angular to rounded sand, quartz, variable silt content, occasional occurrence of pisolithic gravels</p> <p><b>GRAVELLY SILT</b> - ferruginous gravel set in a clay sand mix, of colluvial and medial origin</p> <p><b>SAND</b> - very pale brown medium to coarse-grained, well sorted, little fines, sub-angular to rounded quartz and feldspar, of alluvial origin modified by colluvial processes</p> <p><b>SAND</b> - light grey, fine to coarse, angular to sub-rounded quartz with some feldspar, moderately sorted, loose, of alluvial origin modified by colluvial processes</p> <p><b>SAND</b> - pale and olive-yellow, medium to coarse-grained, sub-angular quartz, moderately sorted, of medial origin modified by marine inundation</p> <p><b>LIMESTONE</b> - light yellowish brown, fine to coarse-grained, sub-angular to well rounded quartz, shell and corals common, corals less common, of marine (trifid and back reef) origin, often overlain by S<sub>2</sub></p> <p><b>SAND</b> - very light grey at surface, yellow at depth, fine to medium-grained sub-rounded quartz, local concentrations of heavy minerals, local development of coffee rock, moderately well sorted, of eolian origin</p> <p><b>SAND</b> over SILT and SANDY SILT - sand as S<sub>2</sub> overlying M<sub>2</sub> and M<sub>3</sub></p> <p><b>SANDY SILT</b> - strong brown to mid-grey, mottled, blocky, disseminated fine sand, hard when dry, of alluvial origin</p> <p><b>SILT</b> - very pale brown silt, soft when moist, firm when dry, low clay content, of alluvial origin</p> <p><b>SAND</b> - light grey to yellowish grey, medium-grained, sub-angular to rounded quartz with some feldspar, moderately sorted, of alluvial origin</p> <p><b>SAND</b> - yellow, fine to medium-grained, sub-angular to rounded quartz with some feldspar, local concentrations of heavy minerals, well sorted, overlying boulder and cobble conglomerates, of alluvial and marine origin</p> <p><b>GRAVEL</b> - brown and reddish brown, ferruginous, pisolithic, occasionally cemented in a clay silt matrix, moderately sorted, of colluvial origin</p> <p><b>LATERITE</b> - massive and cemented, occasionally vesicular, up to 4 m thick, overlying a zone of mottled and/or pallid clays, sometimes overlain by a ferruginous gravel set in a clay sand matrix</p>	<p>Equivalent unit on geological maps</p> <p>Relief/Slope</p> <p>Rock-mineral resources</p> <p>Permeability</p> <p>Slope stability</p> <p>Flow of Erosion</p> <p>Shrink-swell aspects</p> <p>USCS</p>	<p>Flooding</p> <p>Annual flooding</p> <p>Wind transportation, marine erosion</p> <p>Wind transportation</p> <p>Flooding</p> <p>Seasonal inundation</p> <p>Annual flooding</p> <p>Stream flow</p> <p>Stream flow</p> <p>Stream flow</p> <p>Water table leaching/dispersion</p> <p>Sedimentation, some stream flow</p> <p>Sheet wash, stream flow</p> <p>Sheet wash</p> <p>Groundwater recharge</p> <p>Groundwater recharge</p> <p>Groundwater recharge</p> <p>Annual flooding</p> <p>Subject to flooding</p> <p>Stream flow, sediment transport</p> <p>Erosion and fluvial erosion</p> <p>Stream flow, sheet wash</p> <p>Stream flow, sheet wash</p>	<p>High water table, prone to flooding</p> <p>High water table, seasonal flooding, variable bearing capacity depending on peat and clay content</p> <p>Active blowouts and sand sheets, unconsolidated, low fines content gives it considerable potential for fixing certain types of waste and neutralising acids, settlement consolidation potential is removed - as S<sub>2</sub></p> <p>Moderate to steep slopes, very susceptible to mobilisation when sparse vegetation is removed - as S<sub>2</sub></p> <p>Low undulating relief, formative topography, variability thick sands, sometimes overlying LS<sub>2</sub> type limestone, variable bearing capacity depending on consolidation of sands</p> <p>High water table, thin sands have physical properties modified by silts and clays beneath them</p> <p>High water table, prone to flooding, differential settlement may occur</p> <p>High water table, inundated most of year, variability thick, unconsolidated layers of clays, organic silts, silts and silts overlying LS<sub>2</sub> type limestone</p> <p>Swamps with seasonal flooding only, high water table</p> <p>High water table, variable thickness, bearing capacity dependent upon the amount of silt in the material</p> <p>High water table, major streams on coastal plain, sand from eolian and alluvial sources</p> <p>Incipient formation of ironstone deposits, poorly drained</p> <p>Water table leaching/dispersion</p> <p>Big iron or limonite deposited along paleowater tables and along dune water or flow, deposition occurs today, very poor drainage</p> <p>Stream flow, sediment transportation</p> <p>Solifluction, some stream flow</p> <p>Sheet wash, stream flow</p> <p>Often as thin fine overlying S<sub>2</sub>, provides good foundations when compacted</p> <p>Good foundation properties, angularity provides good shear strength</p> <p>Few limitations, some settlement under foundations can be expected, some ability to attenuate pollutants due to small clay content</p> <p>Variable bearing capacity depending on degree of cementation, common solution cavities and fissures could lead to severe settlement under load and also offer an easy path for pollutants down to the water table</p> <p>Depth to water table variable, mobilised if devaluated, permanent cuts unstable, may have coffee rock zones at paleowater table rising from red discoloration to unrippable massive limonite</p> <p>Of variable thickness, the sands physical properties are modified by the underlying silts, high water table</p> <p>High water table, prone to flooding, dispersive in places</p> <p>High water table, prone to flooding in part</p> <p>Restricted to fluvial channel with seasonal flow</p> <p>Marine beach deposits, good compaction characteristics provide good foundations, steep cuts moderately stable, may have zones of coffee rock/feldspar developed at jobstone tables, boulder deposits common at base of unit</p> <p>Requires blasting to excavate, strong foundations but sub-surface drainage is a problem</p> <p>When compacted can stand heavy loads</p>	

REFERENCES

- See Lithological Classification
- These terms are used in the engineering sense. The term "soil" denotes an aggregate of mineral grains which can be separated by gentle mechanical means. The term "rock" denotes an aggregate of minerals cemented by strong and permanent forces.
- Maximum and minimum elevations of the unit with respect to Australian Height Datum
- Slopes expressed qualitatively: F-flat, G-gentle, M-moderate, S-steep. Properties vary with degree of weathering
- M... moderate, H... high, V... very high
- Unified Soil Classification System which describes soils in terms of grain size, grading characteristics and compressibility. For rocks the symbols refer to the weathered products
- land use undesirable for the environment
- possible problems for the environment
- possible problems for the land use
- land use compatible with unit

LITHOLOGICAL CLASSIFICATION

UNCONSOLIDATED MATERIAL

A single capital letter denotes the main lithology of the soil followed, if required, by lower case letters denoting qualifying lithologies in decreasing order of importance - left to right.

ROCK

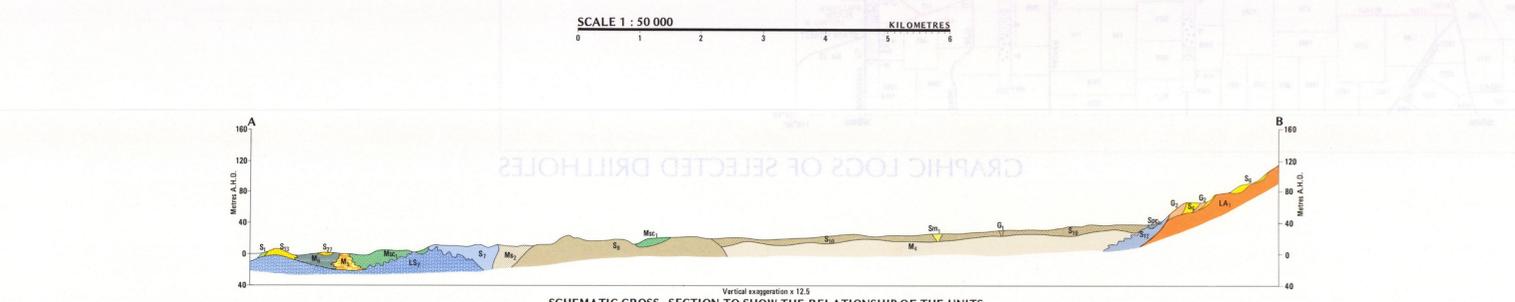
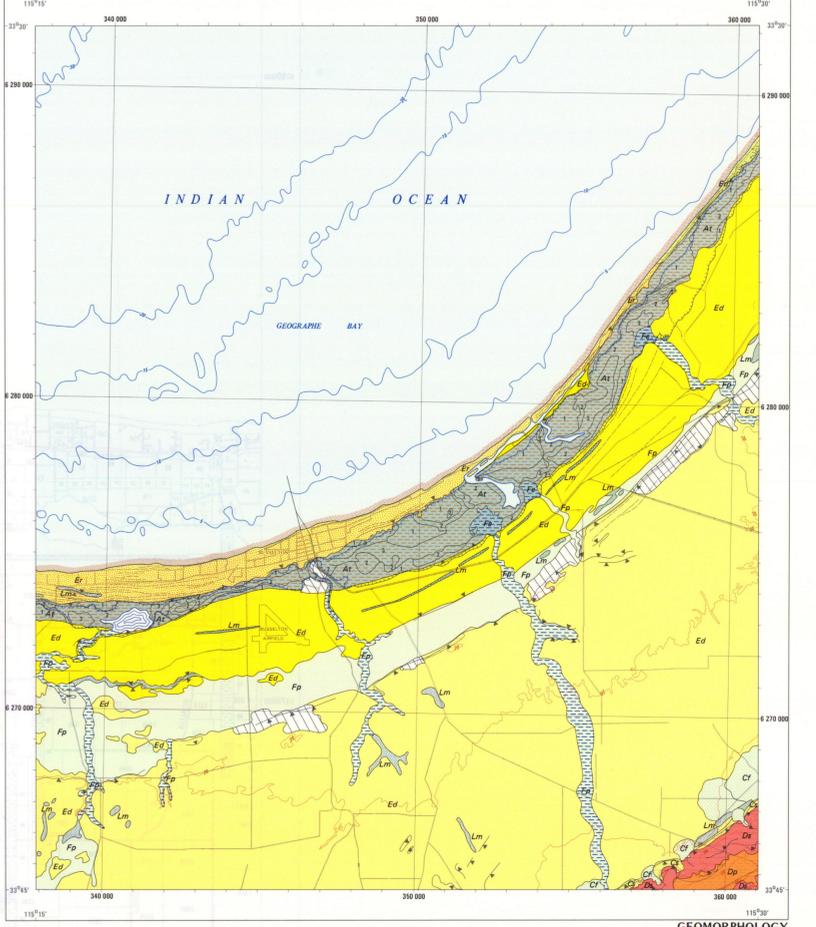
Double capital letters denote lithological symbols of rocks

DIFFERENT MAPPABLE UNITS OF SIMILAR LITHOLOGIES ARE SHOWN BY THE LITHOLOGICAL SYMBOL FOLLOWED BY AN ARABIC NUMBER

SYMBOLS

- GEOLOGY**
  - geological boundary
  - fen
  - macrofaunal locality
  - for building purposes
  - rehabilitated mine site
- HYDROGRAPHY**
  - perennial stream with direction of flow
  - seasonal stream with direction of flow
  - marsh
  - lake
  - height (metres), figure on high side of line
  - depth
  - swathline (mg/L, T.D.S.)
  - Limit of 1 in 100 year flood
  - bathymetric contours in metres
- BOREHOLES, WELLS AND OTHER WORKS**
  - observation borehole
  - water treatment plant
  - storage reservoir, dam or tank
  - tailing pond, waterfilled excavation
  - excavation
  - solid waste disposal site, active
  - liquid waste disposal site, active
- MINERAL RESOURCES**
  - quarry or pit, active
  - quarry or pit, inactive
  - mineral occurrence
  - gravel
  - limonite
  - heavy minerals
  - sand
- TOPOGRAICAL INFORMATION**
  - road, classification as shown
  - railway
  - power line
  - township boundary
  - legal authority boundary
  - state forest boundary
  - contour in metres

The Australian Map Grid covers Australia and the Territories administered by Australia. Zones are 6° wide plus 1/2° overlap. A.M.G. zones are numbered from zone 47 with central meridian 137° E to zone 58 with central meridian 150° E. The origin of each zone is the intersection of the central meridian with the equator. On this map ticks on the sheet edge represent 1000 metre intervals on the superimposed A.M.G. Zone 50.



SCHEMATIC CROSS-SECTION TO SHOW THE RELATIONSHIP OF THE UNITS

INDEX TO SHEETS WITHIN THIS SERIES

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**GEOLOGICAL CLASSIFICATION**

Ed	Parabolic and nested parabolic dunes, dune/ridge dunes	Lm	Marsh in interdunal wale	Cf	Colluvial fans
Er	Relic foredune plain, dune/dune dunes	Lm	Marsh in interbarrier depression	Cd	Colluvial dunes
Ed	Degraded surface of eolian origin, dune/ridge dunes	Lm	Marsh on alluvial plain	Dd	Degraded surfaces of planation and denudational dunes
Ed	Degraded surface of eolian origin, Spearwood Dunes	Fp	River delta	Ds	Surface of planation - shelf
Ed	Degraded surface of eolian origin, Spearwood Dunes	Fp	River floodplain	Mg	Made ground
Ed	Estuarine terraces, where identified	Fp	Alluvial plain	Lk	Lake

**SLOPES**

- 0°-5°
- 5°-10°
- 10°-20°

**FEATURES**

- Prominent ridge
- Sharp convex break of slope
- Sharp concave break of slope
- Limit of 1 in 100 year flood
- Mic relief trend lines

**ORIGIN LANDFORM**

A	estuarine	d	dune	p	plain
C	colluvial	e	delta	r	ridge
D	denudational	f	fan	s	slope
E	eolian	m	marsh	t	terrace
F	fluvial				
L	limonite				
La	lacustrine				
Ed	eolian dune	Cd	colluvial dune		

The geomorphological classification comprises a single capital letter which denotes the origin of the material and a lower case letter which represents the landform.

**Cartography** by the Surveys and Mapping Division, Department of Mines, Western Australia.

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SHEET 1930 I



**GRAPHIC LOGS OF SELECTED DRILLHOLES**