

Map Unit	Description	Equivalent unit on geological maps	Rate ² slope ⁴	Industrial mineral resources	Shear strength	Compressibility	Permeability	Shrinkage potential	Workability as an aggregate	CURRENT PROCESSES	SUITABILITY FOR SPECIFIED LAND USES					NOTES
											Foundations	Road fill	Base course	Septic tanks	Excavation (very limited)	
Unconsolidated Material	Rock															
Sp	PEATY SAND — dark grey and black medium-grained quartz, variable organic content	Lake and swamp deposits (D)	0-10m: F							SW	High water table, prone to flooding, variable bearing capacity due to organic content, very high hazard rating	×	×	×	×	
S ₂	SAND — white, medium to coarse-grained, moderately well sorted, quartz and shell debris	Beach and dune deposits (D)	0-160m: G	Limesand	H	L	H	L	N	N	H	SW	Wind transport	×	×	×
S ₃	SAND — white, medium-grained rounded quartz and shell debris		0-4m: F	Limesand	L	L	H	L	N	N	H	SW	Wind transport	×	×	×
S ₄	SAND — white to pale grey, fine to medium, occasionally coarse, angular to sub-angular quartz, few lines, moderately sorted	Aluvium (D) and estuarine and lagoonal deposits (D)	3-100m: F	Low quality specification sand and fill	M-H	L	H	L	N	N	M	SW SP	Stream flow, flooding	×	×	×
M ₄	SILT — white, loess-like, firm, friable, mostly silty, trace of fine, angular quartz	Estuarine and lagoonal deposits (D)	4-25m: F	Brick and other structural clay products	L-M	M	L	L-M	L-M	M	ML	SW	Soil moisture changes	×	×	×
LS ₁	LIMESTONE — pale yellowish brown, weakly cemented, friable, medium-grained, sub-rounded quartz and shell debris	Dunes on D (D)	60-80m: M	Limesand	V	V	H	V	N/A	N/A	M-H	N/A	Solution, wind transport	×	×	×
Sr	SAND — pale and olive yellow, medium to coarse-grained quartz, sand, trace of silty, occasional pebbles of limestones	Quartz sand (D)	5-250m: G	Specification sand	H	L	H	L	N	N	H	SW	Wind transport, surface wash	×	×	×
LS ₂	LIMESTONE — light yellowish brown, fine to coarse-grained, sub-angular quartz, silty, surface karst	Limestone (D)	0-240m: G		H	L	H	L	N	N	M	N/A	Solution, wave action	×	×	×
S ₅	SAND — light grey, fine to coarse, angular to sub-rounded quartz, loose, moderately sorted, occasional pebbles of limestones	Sand (D)	10-50m: G	Fill sand	L	L	H	L	N	N	H	SW	Intermittent stream flow	×	×	×
G ₂	GRAVEL — strong brown, coarse, sub-rounded, brachiopods, bivalves, variable amounts of sand and silt in matrix	Laterite (D)	40-50m: G	Gravel	H	L	H	L	N	N	H	GW	Surface wash	×	×	×
LA ₁	LATERITE — massive, friable to strongly cemented, vesicular, some sand content, developed on S ₁		10-80m: G		H	N/A	M-H	N/A	N	N/A	L	N/A	Surface wash	×	×	×
ST ₁	SILTSTONE — brown and yellowish brown, friable, clayey and sandy	Plantagenet Group (P)	10-60m: G	Brick and other structural clay products	H	N/A	N/A	N/A	N/A	N/A	M	N/A	Surface wash, soil moisture changes	×	×	×
DO	DOLERITE — fine-grained, melanocratic sill and rare dyke	Dolerite (D)	0-80m: G-S	Dimension stone, crushed rock	H	N/A	N/A	N/A	N/A	N/A	L	N/A	Surface wash, wave action	×	×	×
Smc	CLAYEY SILTY SAND — pale yellowish brown, moist, fine to medium, angular quartz, silt and sand with common pebbles and cobbles of granite (D)		10-150m: G		M	L	L-M	L-M	N-L	L	M	SM	Soil moisture changes	×	×	×
Sp	GRAVELLY SAND — coarse angular quartz sand with common pebbles and cobbles of granite (D)	Granite (D)	20-70m: G	Sand and gravel	M-H	L	H	L	N	N	M	SP	Some surface wash	×	×	×
GR	GRANITE — fine to coarse, even-grained and porphyritic granitic rocks		0-260m: G	Dimension stone, crushed rock	H	N/A	N/A	N/A	N/A	N/A	L	N/A	Channelled stream flow, surface wash	×	×	×
GN	GNEISS — fine to medium, even-grained, layered and porphyritic gneiss with interfoliated, gneissic fabric	Gneiss (D)	100-210m: G	Crushed rock	H	N/A	N/A	N/A	N/A	N/A	L	N/A	Channelled stream flow, surface wash	×	×	×

REFERENCES

- See Lithological Classification
- The terms "unconsolidated material" and "rock" are used in the sense of the engineering terms "soil" and "rock"

- Maximum and minimum elevation of the unit with respect to the Australian Height Datum.
- The terms "unconsolidated material" and "rock" are used in the sense of the engineering terms "soil" and "rock"

- Slopes expressed qualitatively:
F — fair
G — gentle
M — moderate
S — steep
The dominant slope of each unit is given

- H — high
M — moderate
L — low
N — none
N/A — not applicable
Properties vary with degree of weathering

- 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

The data contained on this sheet are provided for preliminary studies and are not intended as a substitute for detailed on-site investigation. The seaward part of this map should not be used for navigation purposes.

LITHOLOGICAL CLASSIFICATION

UNCONSOLIDATED MATERIAL

A single capital letter denotes the main lithology of the unit 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

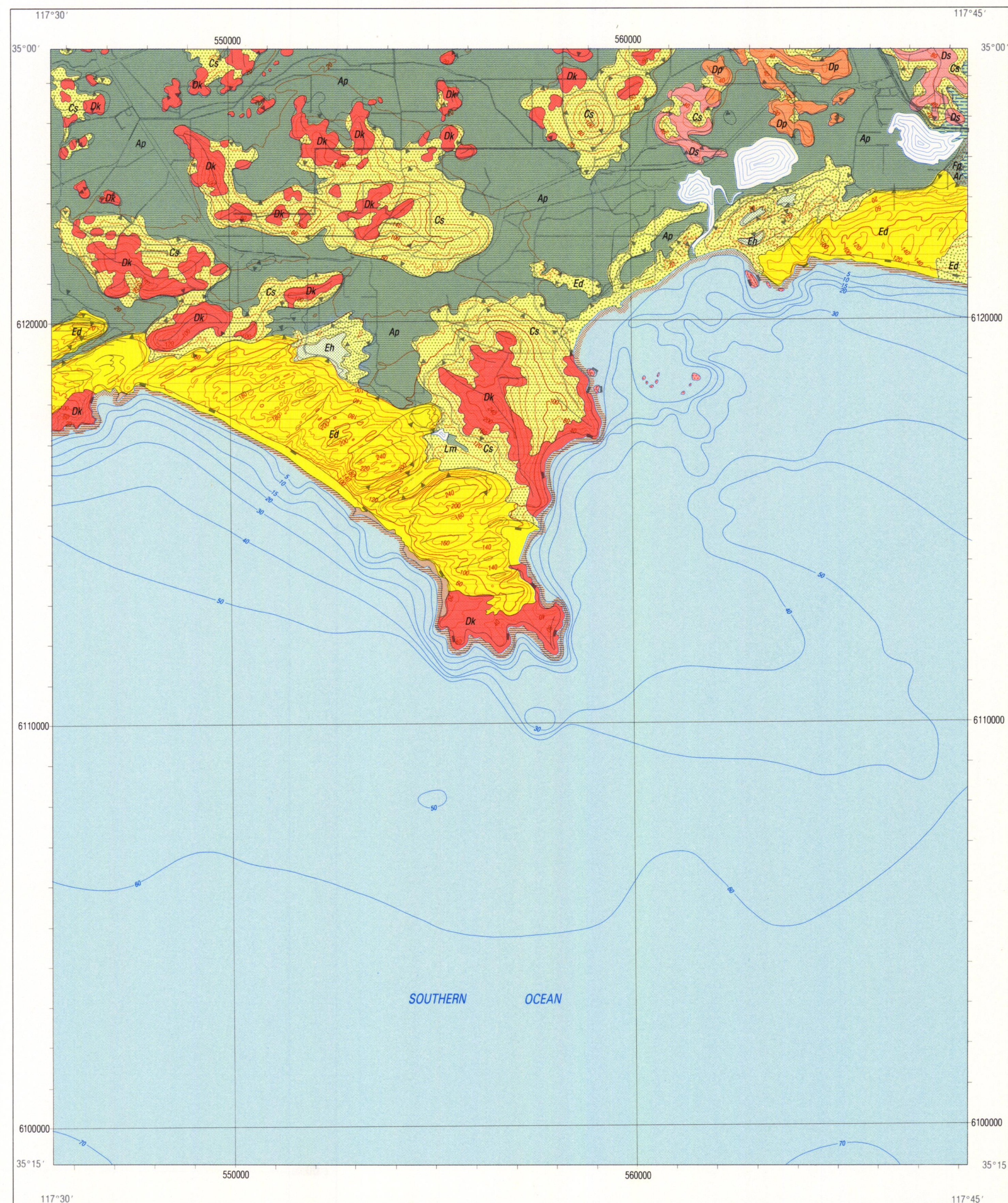
GEOLOGY

HYDROGRAPHY
Seasonal stream with direction of flow
Swamp
Lake
Bathymetric contour in metres

BOREHOLES, WELLS AND OTHER WORK
Solid waste disposal site, active
Drain

MINERAL RESOURCES
Quarry or pit, active
Quarry or pit, inactive
Mineral occurrence
Gravel
Limestone
Sand

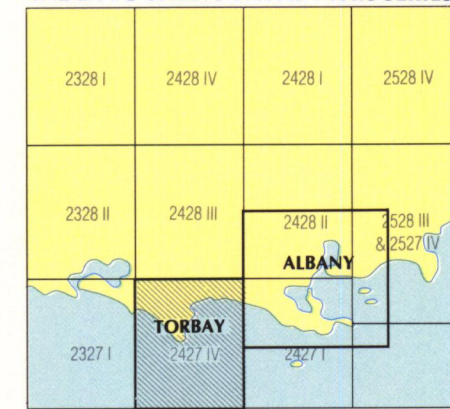
TOPOGRAPHICAL INFORMATION
Road, classification as shown
Railway
Township boundary
Agricultural area boundary
Contour in metres



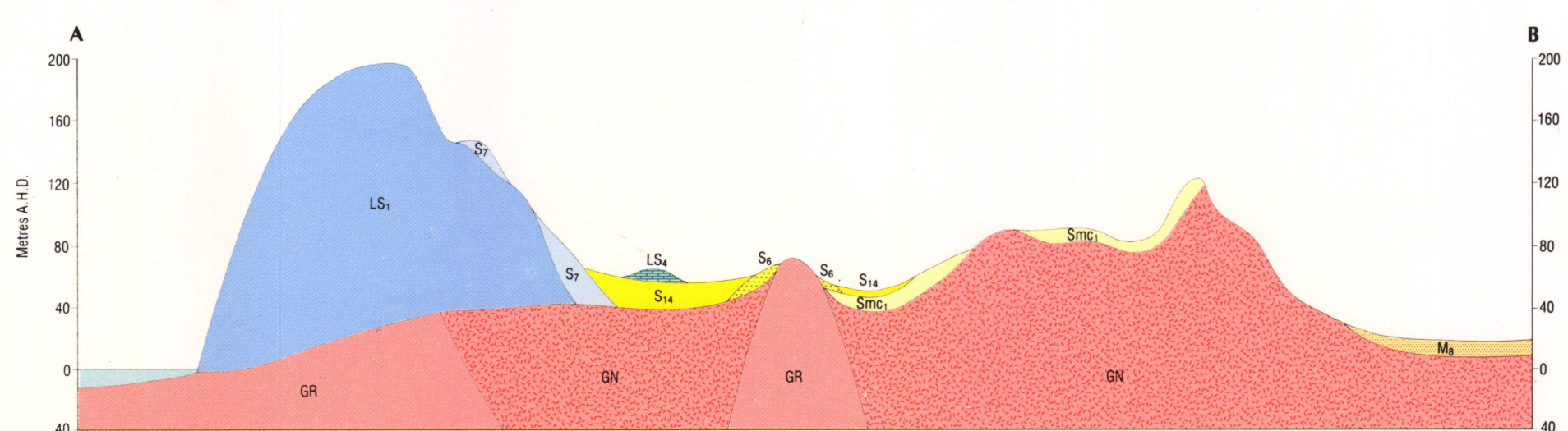
GEOMORPHOLOGY

GEOMORPHOLOGICAL CLASSIFICATION		SLOPES		FEATURES	
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes	0°-3°	Prominent ridge		
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes	3°-10°	Sharp convex break of slope		
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes	10°-20°	Sharp concave break of slope		
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes		Cut		
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes				
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes				
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes				
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes				
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes				
Ed	Parabolic and ventral parabolic dunes, Quindrup Dunes				

INDEX TO SHEETS WITHIN THIS SERIES



ALBANY — sheet in this series
2428 I — 1:50,000 Sheet Index



Vertical exaggeration x 12.5
SCHEMATIC CROSS-SECTION TO SHOW THE RELATIONSHIP OF THE UNITS

The Australian Map Grid covers Australia and the Territories administered by Australia. Zones are 6° wide plus 1° overlap. A.M.G. zones are numbered from zone 47 with central meridian 96°E to zone 58 with central meridian 156°E. The origin of each zone is the intersection of the central meridian with the equator. On this map the 100m contour lines represent 100m intervals on the superimposed A.M.G. Zone 50.

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

ORIGIN
A — estuarine
C — colluvial
D — denudational
E — eolian
F — fluvial
L — lacustrine
M — marine

LANDFORM
d — dune
h — hollow
k — knoll, inselberg
m — marsh
r — ridge
s — slope
x — rock platform

Rocky coast with hard cliffs and small sandy beaches. The impact of medium scale dynamic changes and storm patterns is unlikely to alter the shoreline position by any great extent.

Sandy coast. Storm and erosion cycles have the greatest impact on these coasts. Without protection large scale erosion during stormy years is likely to occur. Once erosion does start there is little to stop it. Preservation of the dunes and their vegetation is important in facilitating recovery following storm onset and beach erosion.

Cartography by the Surveys and Mapping Division, Department of Mines, Western Australia.
Topographic base from compilations by the Department of Land Administration.
Cadastral base from the Department of Land Administration.
Published by and available from the Geological Survey of Western Australia, Department of Mines, 100 Plain Street, East Perth, 6004.
Printed by the State Printing Division, Department of Services, Western Australia, 1989.
Bibliographic Reference: Gough, J.R. 1989. Torbay Sheet 2427 IV. Environmental Geology Series, Geological Survey of Western Australia.

