HYDROGEOLOGICAL MAP OF WESTERN AUSTRALIA 1989

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SCALE 1 : 2 500 000

0 100 200 300 400
KILOMETRES

ALBERS EQUAL AREA PROJECTION WITH STANDARD PARALLELS 17°30' AND 31°30'S

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Copies of this map may be obtained from the Geological Survey of Western Australia, 100 Plain St, East Perth 6004

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AQUIFERS

SURFICIAL SEDIMENTS — SHALLOW AQUIFERS

Cainozoic alluvial, littoral and eolian sediments up to 100m thick in major drainages, palaeodrainages and on coastal plains. Groundwater generally at a shallow depth and readily exploitable. Palaeodrainages generally contain saline water. Coastal aquifers are subject to sea water intrusion.

- Sand, gravel, generally high yields
- Limestone, calcrete, generally high yields
- Undifferentiated surficial sediments, low to moderate yields

Stratigraphic symbols
Quaternary . . . . . Q
Tertiary . . . . . T

SEDIMENTARY ROCKS — EXTENSIVE AND DEEP AQIFERS

Phanerozoic sedimentary rocks in the sedimentary basins, thick and extensive, generally flat lying or gently dipping, and relatively unconsolidated. Groundwater flow systems extend to depths of several thousand metres in some basins. Generally high yields available.

- Sand, sandstone
- Limestone

MAJOR AQUIFERS IN SEDIMENTARY BASINS

		PERTH COLLIE	CARNARVON	CANNING	OFFICER	EUCLA	BREMER	BONAPARTE ORD
Tertiary	T		TULKI LS			ABRAKURRIE LS WILSON BLUFF LS THAMPTON LS	WERRILUP FM	
Cretaceous	K	LEEDERVILLE FM PARMELIA FM	WINDERING SS	RHOMBE SS	SAMUEL FM	LOONGANA SS		
Jurassic	J	CADDAGUPE FM COCKLEBIDDY FM CADLY FM LESUEUR SS		ALEXANDER FM WALLAL BS				
Triassic	Tr			ERSKINE SS				
Permian	P		MALLENS SS	LIVERINGA GP PRIVATE SS				
		SUE COAL M COLLIE COAL M	MOOGOOLOO SS	POOLE SS / M CANOLING FM				
				PATTERSON FM				KEEP INLET FM
				BETTY FM				U
Carboniferous	C							U
Devonian	D		U	U		LENNIS SS		
Silurian	S	TUMBLAGOODA SS						
Ordovician	O			U				

SS . . . . . Sandstone
FM . . . . . Formation
GP . . . . . Group
LS . . . . . Limestone
M . . . . . Measures
U . . . . . Undifferentiated aquifers

Concealed aquifers shown by superposition of symbols, eg $\frac{K}{T}$

Unsaturated cover shown in brackets, eg $(\frac{K}{T})$

ROCKS OF LOW PERMEABILITY, FRACTURED AND WEATHERED ROCKS — LOCAL AQUIFERS

Phanerozoic sedimentary rocks of low permeability and generally low yields, in places overlying and concealing major aquifers. Precambrian and Cambrian sedimentary, igneous and metamorphic rocks, indurated and often deformed and metamorphosed. Groundwater is generally restricted to the weathered zone and to fractures which seldom extend to depths below 100m. Groundwater occurrence is affected by rock type, structure, topography and climate, and bores may require precise siting for success. Yields and salinity are highly variable.

Phanerozoic sedimentary rocks
- Undifferentiated; mainly shale and thin sands with low yields
- Confining bed overlying a major aquifer

Precambrian and Cambrian fractured rocks
- Sandstone
- Shale
- Limestone
- Dolomite
- Sedimentary rocks, undifferentiated
- Metamorphic rocks
- Basalt; intermediate and acid volcanics
- Dolerite, gabbro and ultrabasic intrusions
- Volcanic and sedimentary rocks in greenstone belts, undifferentiated
- Gneiss, migmatite
- Granitoid

Thick and extensive weathered profile

Stratigraphic symbols

Jurassic	J	Cambrian	C
Triassic	Tr	Proterozoic	P
Permian	P	Upper	Pu
Ordovician —Devonian	O–D	Middle	Pm
		Lower	Pl
		Archaean	A

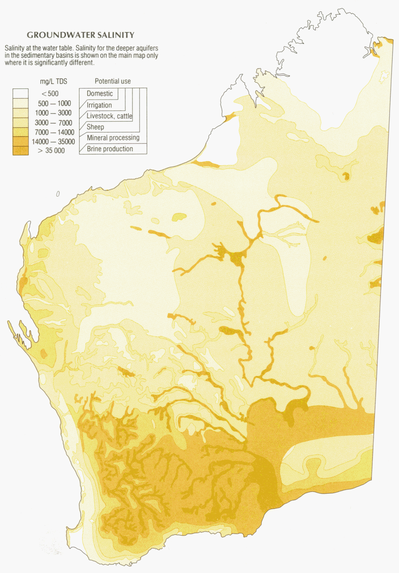
SYMBOLS

- Aquifer boundary
- Aquifer boundary, uncertain or concealed
- Fault, concealed
- Anticline
- Syncline
- Isopotentiial (metres above sea level) — 50
- Boundary of area with artesian flow
- Groundwater flow direction
- Isohaline of underlying aquifer (mg/L Total Dissolved Salts) — 2 000
- Drainage, perennial; reservoir
- Drainage, intermittent
- Salt lake, playa, saline lake
- Area with rising water table, subject to soil salinization
- Drainage, perennial, brackish or saline (> 1000 mg/L Total Dissolved Salts)
- Borefield for water supply to town or mine
  - abstraction >10 million m³/a
  - 1–10 million m³/a
  - < 1 million m³/a
- Area of intensive groundwater development for irrigation
- Water pipeline, groundwater source
- Water pipeline, Comprehensive Water Supply Scheme
- Groundwater desalination plant for town water supply
- Artificial recharge scheme
- Town using groundwater for whole or part of reticulated supply
- Road
- Railway
- Town — DONGARA
- Locality — KATANNING (1) COMMON ● Wintarthy ● Mid. Gdtown
- Homestead

GROUNDWATER SALINITY

Salinity at the water table. Salinity for the deeper aquifers in the sedimentary basins is shown on the main map only where it is significantly different.

mg/L TDS	Potential use
< 500	Domestic
500 — 1000	Irrigation
1000 — 3000	Livestock, cattle
3000 — 7000	Sheep
7000 — 14000	Mineral processing
14000 — 35000	Brine production
> 35 000	



BORE DENSITY

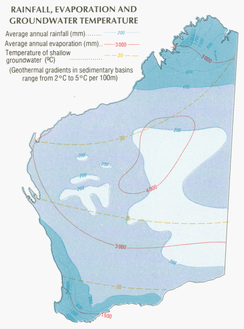
1 dot = 20 bores

SURFACE DRAINAGE

Drainage, seasonal or perennial
Salt lake, playa
Palaeodrainage, ephemeral or uncoordinated

RAINFALL, EVAPORATION AND GROUNDWATER TEMPERATURE

Average annual rainfall (mm)
Average annual evaporation (mm) — 3 000
Temperature of shallow groundwater (°C) — 25
(Geothermal gradients in sedimentary basins range from 2°C to 5°C per 100m)



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