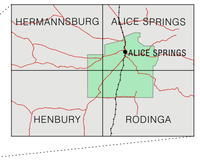
MAP LOCALITY & 1:250 000 SHEET INDEX



Cartography by L. J. Fritz, - June 2009
Spatial Data & Mapping, Natural Resources Division,
Department of Natural Resources, Environment,
The Arts and Sport (NRETAS)

Design File: Alice-Springs-GWater_250k_m53

Map Product; Alice-Springs_Groundwater_250k

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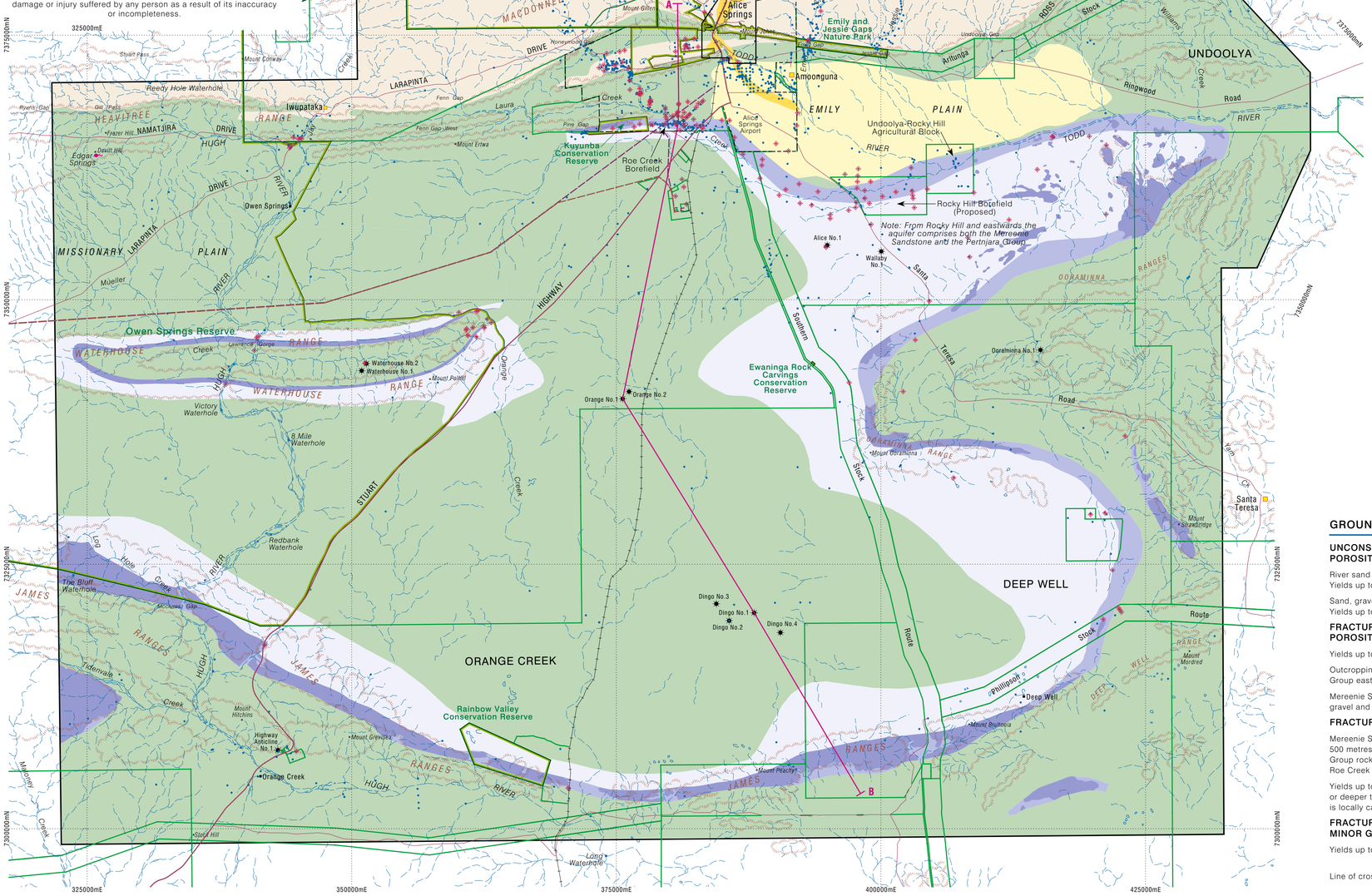
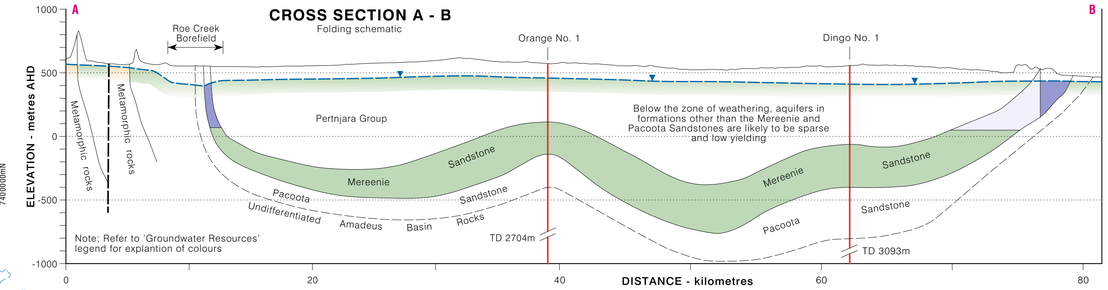
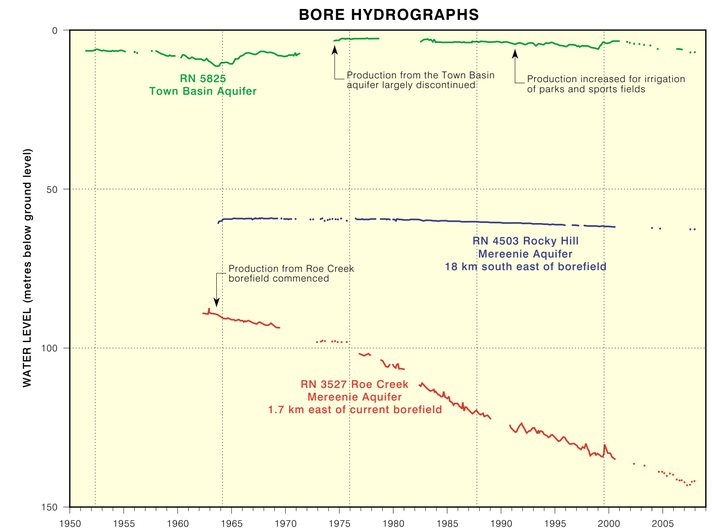
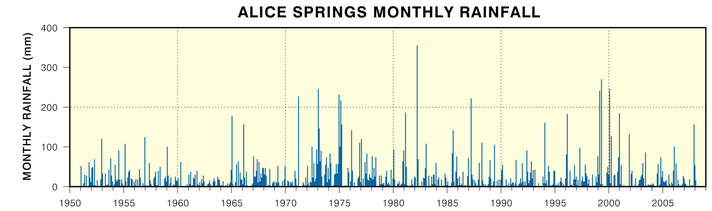








GROUNDWATER RESOURCES

UNCONSOLIDATED SEDIMENTS with INTERGRANULAR POROSITY

- River sand and gravel to depths of 30 metres. Yields up to 5.0 L/s
- Sand, gravel and sandstone to depths of 150 metres. Yields up to 5.0 L/s

FRACTURED ROCKS with SOME INTERGRANULAR POROSITY

- Yields up to 20.0 L/s, locally up to 100 L/s
- Outcropping Mereenie Sandstone (and Pertnjara Group east of Rocky Hill). Potential recharge area
- Mereenie Sandstone beneath thin cover of sand, gravel and clay. Potential recharge area

FRACTURED and WEATHERED ROCKS

- Mereenie Sandstone, where its top is shallower than 500 metres and where it is overlain by Pertnjara Group rocks. Higher yields only encountered in the Roe Creek area
- Yields up to 2.5 L/s. Mereenie Sandstone either absent or deeper than 500 metres. The Pacoota Sandstone is locally capable of yielding up to 50 L/s

FRACTURED and WEATHERED ROCKS with MINOR GROUNDWATER RESOURCES

- Yields up to 0.5 L/s

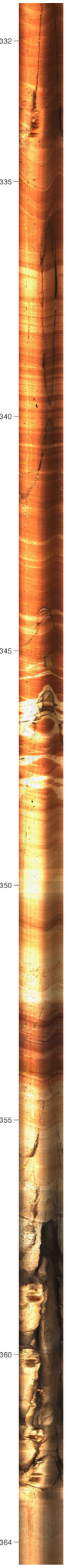
Line of cross section ..... A — B

GROUNDWATER FEATURES

- Alice Springs Water Control District boundary
- Water bore
- Monitoring bore
- Spring

GENERAL FEATURES

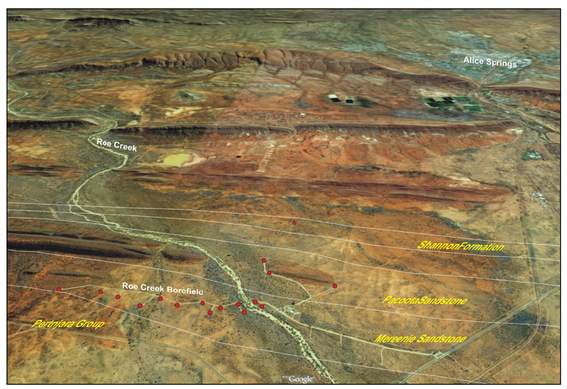
- Property boundary
- Park / Reserve
- Alice Springs Local Government Area
- Population centre - major ..... Alice Springs
- Population centre - minor ..... Iwupataka
- Pastoral homestead ..... Orange Creek
- Principal road
- Secondary road
- Minor road
- Local road / track
- Railway
- Gas pipeline
- Oil pipeline
- Oil/gas exploration well
- Intermittent watercourse
- Relief



A 360 degree view of the wall of a borehole drilled in the Mereenie aquifer at Roe Creek. The image was captured with a down-hole scanner. Depths are in metres below ground level. (Image courtesy of Power Water Corporation)

Open fractures like these provide the bulk of the groundwater to production bores.

ALICE SPRINGS TOWN WATER SUPPLY



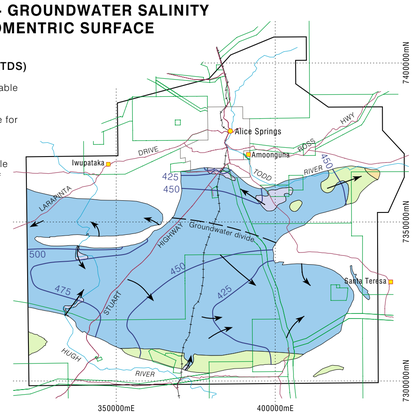
Alice Springs currently obtains it's water from a series of bores referred to as the "Roe Creek Borefield". These are located some 12km southwest of the town. The borefield produces 9000 megalitres/year. The amount of recharge is less than the extraction so groundwater levels in the vicinity of the bores are dropping at a steady rate. A new borefield will have to be established in the future when water levels fall to a depth that is uneconomic to pump from. The preferred site is the Rocky Hill area, some 25 km to the southeast of the town.

The borefield taps aquifers in three layers of sedimentary rocks which dip to the south at about 30°. The main one is the Mereenie Sandstone but the Pacoota Sandstone and the Shannon Formation are also utilised. Infrequent flash floods in Roe Creek are in important recharge source. Flood waters can seep down into the aquifers where the creek cuts across the zone where the formations outcrop or are at shallow depths.

MEREENIE AQUIFER - GROUNDWATER SALINITY and POTENTIOMENTRIC SURFACE

Groundwater Salinity - mg/L (TDS)

- Less than 500 mg/L, suitable for human consumption
- 500 - 1000 mg/L, suitable for stock, domestic and most irrigation
- 1000 - 3000 mg/L, suitable for stock and irrigation of salt tolerant crops
- More than 3000 mg/L, suitable for stock
- Groundwater flow
- Groundwater divide
- 425 Potentiometric surface (metres AHD)
- Water Control District
- Road



Water suitable for human consumption is limited to parts of the aquifer where the rate of recharge is highest. The bulk of this fresh water was recharged up to tens of thousands of years ago when the climate was wetter. Elsewhere the water is generally suitable for stock and for irrigation of salt tolerant crops. Under natural conditions groundwater flows under the action of gravity at very slow rates (less than a millimetre/year) to low parts of the landscape where it discharges. In the case of the Mereenie aquifer the natural flow is dominantly eastwards. No discharge zones such as springs have been identified in the map area. It is probable that deep rooted vegetation taps the watertable and accounts for all of the discharge. Pumping from the Roe Creek borefield has reversed the natural flow direction in areas up to 30 km away.

Prepared and produced by the
Spatial Data and Mapping, Land and Water Division,
Department of Natural Resources, Environment, The Arts and Sport
Northern Territory of Australia, November 2008

This map was produced on the Geocentric Datum of Australia 1994 (GDA 94)

kilometres 0 5 10 20 30 kilometres

Black numbered lines are 25 000 metre intervals of the Map Grid of Australia (MGA), Zone 53
Universal Transverse Mercator Projection
Horizontal Datum: GDA 94 Vertical Datum: AHD (metres)

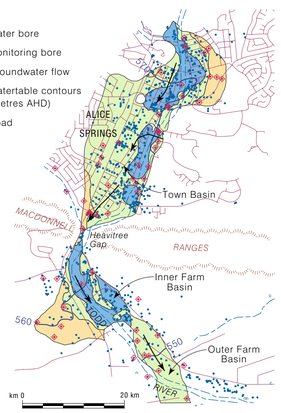
ALLUVIAL AQUIFER - WATER QUALITY and WATERTABLE ELEVATION

Groundwater Salinity - mg/L (TDS)

- Less than 1000 mg/L, suitable for garden watering and locally for human consumption
- 1000 - 3000 mg/L, limited suitablility for gardens
- More than 3000 mg/L, too saline for garden watering

- Water bore
- Monitoring bore
- Groundwater flow
- 570 Watertable contours (metres AHD)
- Road

The Todd River has deposited sand, gravel and clay in its valley to a depth of up to 30 metres. These alluvial deposits are preserved in three small basins; the Town, Inner Farm and Outer Farm Basins connected to each other by narrow gaps in the ranges. The sands and gravels contain important aquifers. Those in the Town Basin were formerly used as the main water supply for Alice Springs. Since the Roe Creek borefield came into production in 1964 they have only been used for watering parks and sports fields. The aquifers are recharged whenever the river floods. This is reflected in the pattern of groundwater salinity with the freshest waters flanking the river. Individual bores can yield up to 5 litres/second. Note: the salinity in individual bores can change over time depending on recharge events. Above average rainfalls in the 1970's recharged the aquifer to record levels (see the bore hydrographs). Groundwater levels are still declining from that event. The resulting shallow watertables caused soil salinity to develop, particularly in low lying areas.



Water Resource information has derived from geological maps, remote sensing products and drilling records.

The map has been prepared at a scale of 1 : 250 000 and enlarging this map beyond this scale will not provide further detail.

Hydrogeology: S. J. Tickell
Water Resources, Natural Resources Division,
Department of Natural Resources, Environment, The Arts and Sport.

Northern Territory Government

ALICE SPRINGS GROUNDWATER

For further information contact
Principal Engineer, Water Resources, Natural Resources Division,
Department of Natural Resources, Environment, The Arts and Sport
Goyder Centre, 25 Chung Wah Terrace, Palmerston, Northern Territory of Australia
Ph. (08) 8999 3606, Fax. (08) 8999 3666