

NORTHERN TERRITORY GROUNDWATER PROSPECTS

GROUNDWATER PROSPECTS

- Moderate to high yields, moderate regular recharge, local water quality limitations in coastal areas
- Moderate to high yields, low intermittent recharge, local water quality limitations
- Low to moderate yields, moderate to low regular recharge, local water quality limitations in coastal areas
- Low to moderate yields, low intermittent recharge, local water quality limitations
- Low yields, low intermittent recharge, water quality limitations

WATER ALLOCATION PLANNING

- Declared Water Allocation Planning Area
- Draft Water Allocation Planning Area

GROUNDWATER DISCHARGE

DISCHARGE

Groundwater discharges at low-lying points in the landscape. It can take the form of individual springs or as diffuse seepage into stream beds. Recharge to groundwater is greatest in the higher rainfall zone in the north, so discharge is correspondingly greater.

Many streams in the north maintain a flow for at least part of the long dry season because of groundwater discharge. Some streams, particularly those with major karstic or porous rock aquifers in their catchments, flow throughout the dry season. Springs with significant discharges (more than 100 L/s) only occur in karstic aquifers.

Another mechanism for groundwater discharge is where trees in the riparian zone directly tap the water table. This occurs throughout the Territory, but in the arid south it is thought to be the dominant process along with discharge through salt lakes.

This map shows recorded springs and streams that flow throughout the dry season. The streams have been classified according to their flow at the end of the dry season. The classification only extends to the road limit, so some streams which stop to appear before reaching the coast.

SPRINGS

- Spring
- Major Spring
- Salt Lake

END OF DRY SEASON FLOWS

- Greater than 100 Litres/second
- 10 to 100 Litres/second
- Up to 10 Litres/second

AQUIFER

- Karstic Aquifers

Source: Hydria Database and existing hydrogeological maps. Northern Territory Department of Land Resource Management.

PALAEOVALEYS

A relic drainage system that formed in the Tertiary are between 2 and 65 million years ago is preserved in the south western part of the Territory. It comprises small sedimentary basins and narrow palaeovalleys.

Aquifers are developed in river sands and gravels that form part of the channel and basin fills. Shallow calcareous layers can host karstic and karstic aquifers.

Apart from the Ti-Tree Basin and some palaeovalleys in the Tanami desert, few of these deposits have been investigated for their groundwater potential.

This map has been compiled from geological maps, satellite imagery and water bore data. In many places it is highly speculative due to the sparse drilling in these areas.

Palaeovalleys and Sedimentary Basins

Source: Palaeovalley Groundwater Project, Northern Territory Department of Land Resource Management and Geoscience Australia, Australian Government.

SALINITY and RAINFALL

GROUNDWATER SALINITY

All groundwaters contain dissolved salts, derived either from weathering of the host rock, from the minerals contained in rainfall or from evaporite deposits. The latter are salt deposits formed at the same time as the surrounding sedimentary rocks.

The map depicts groundwater salinities measured from individual water bores.

It shows generally low salinities in the north. In those areas, high rainfall, higher recharge rates and a faster through flow of groundwater leads to this opportunity for salts to be concentrated by evaporation in the soil before they are flushed down to the aquifer.

The reverse is true in the arid zone to the south where salinities are highly variable and range up to values almost twice the concentration of seawater (34,000 mg/L TDS). Low salinities observed in the arid zone reflect localised areas of enhanced recharge such as along rivers and floodplains.

A prominent area of saline groundwaters to the north west of Tennant Creek reflects extensive evaporites within the Georgina Basin. Both gypsum (calcium sulphate) and halite (sodium chloride) occur in the rocks of that area.

TOTAL DISSOLVED SOLIDS (TDS)

- 0 - 500 mg/L
- 500 - 1000 mg/L
- 1000 - 3000 mg/L
- 3000 - 7000 mg/L
- 7000 - 14000 mg/L
- 14000 - 59000 mg/L

Legend for TDS: Fresh, Brackish, Saline, Saline - unsuitable for most purposes.

Annual Rainfall (mm)

Source: Hydria Database, Northern Territory Department of Land Resource Management, Median Annual Rainfall, 2003, Bureau of Meteorology, Australian Government.

YIELD

BORE YIELD

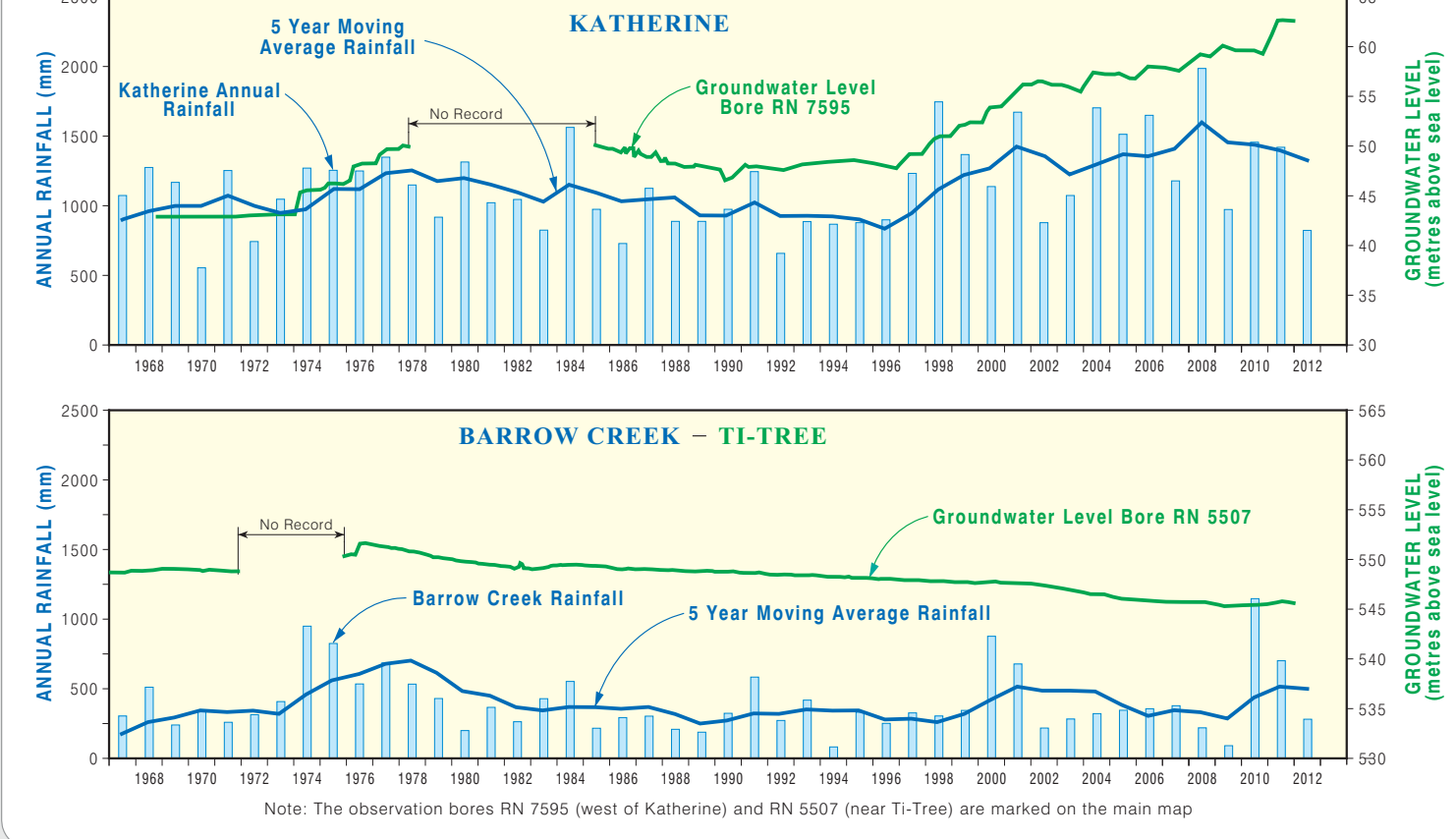
The map shows the most likely range of bore yields that can be expected for a particular area. Note that higher or lower yields can be encountered depending on local conditions.

The higher yields (more than 5.0 Litres/second) occur in fractured and karstic aquifers, while low yielding aquifers include granite and shale.

Most fractured rock aquifers give intermediate yields (0.5 - 5.0 Litres/second), while low yielding aquifers include granite and shale.

Legend for Bore Yield: 5.0 - 50.0 Litres/second, 5.0 - 10.0 Litres/second, 0.5 - 5.0 Litres/second, 0.5 - 2.5 Litres/second, 0.05 - 0.5 Litres/second.

Source: Hydria Database, Northern Territory Department of Land Resource Management, 1:250,000 scale digital geology, Geological Survey, Northern Territory Department of Mines and Energy.



Legend for the main map:

- Darwin: Main Population Centre
- Barrow Creek: Major Population Centre
- Albany: Minor Population Centre
- Ti-Tree: Locality
- Albany: Pastoral property
- Albany: Property boundary
- Albany: Water Control District
- Albany: Water Allocation Plan
- Albany: National Park, Reserve or managed for conservation

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The recommended reference for this map is: Tickell S.J. 2013. Groundwater of the Northern Territory, 1:2 000 000 scale. Department of Land Resource Management, Northern Territory.

Warning: Colours will fade with prolonged exposure to light

Northern Territory Government

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