

# MAP 12 – HYDROGEOLOGICAL INVENTORY



These maps are complementary to the 1:250 000 scale hydrogeological maps which use as a basis, a compiled 1:250 000 scale geology layer (derived from 1:25 000, 1:50 000, 1:63 360 scale geological maps together with some areas where only reconnaissance mapping is available). These 1:100 000 scale maps are easier to read and use the regional groundwater prospectivity boundaries from the 1:250 000 scale maps as background information in the absence of more detailed hydrogeological coverage across the whole State. They should be used in conjunction with the 1:250 000 scale maps and other more detailed hydrogeological maps and site specific reports, if available, as a preliminary to more intensive groundwater studies in a particular area. If additional projects are undertaken in targeted prioritised areas of the State, these maps can be further developed and made more site specific.

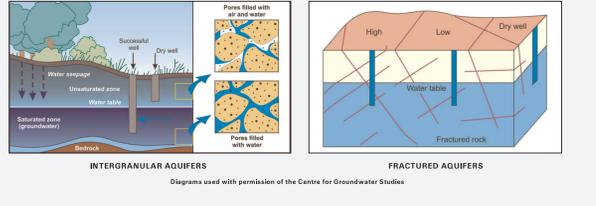
Boreholes shown on the map are those with locations mostly supplied by drillers and from location in the field by MRT staff. There are many open boreholes installed for investigation and production purposes in coastal sand deposits in Tasmania that may not be shown on these maps at this stage. Boreholes with yields >0.02 L/s have been considered for successful bases. Outputs of boreholes are those supplied by drillers and are mostly the result of short term pumping measurements. Some boreholes that outputs have not been reported. Boreholes reported as dry holes usually have a small unreported yield (<0.02 L/s).

Small elevated areas of any hydrogeological unit will usually have lower prospectivity because of limited storage and high drainage rates. In areas where there is little or no water bore data (e.g. Southern Tasmania), the groundwater prospectivity has been assumed to be similar to that in the areas where data are widely available. In areas of low rainfall, water quality can be poorer and water usage may be limited.

These maps provide some additional information to the 1:250 000 scale hydrogeological maps in that there are some subdivisions of Permian and Triassic age units. There is some difference in hydrogeological properties and prospectivity between these units. For example the Upper Triassic fine sandstones, mudstones and coal measures has lower prospectivity and poorer quality groundwater than the Lower Triassic and Permian rocks in most locations. The three dimensional shaded relief enables users to understand the spatial relationship between adjoining groundwater units.

There is usually a degree of vertical stratification in the groundwater quality within the aquifers and results presented represent a composite value of salinity from drill holes at a particular site. Natural groundwater quality is influenced by annual rainfall and the evaporation (e.g. high rainfall, low evaporation areas tend to have better quality groundwater than low rainfall, high evaporation areas). The composition of the rock types through which the groundwater passes and is stored in and by physical properties of the rocks such as permeability and porosity. Human activities such as extensive groundwater pumping, pollution from various waste disposal activities and use of chemicals (agriculture, forestry, industry etc.) also may have negative effects on groundwater quality.

The geology including aquifer prospectivity, groundwater quality and the relationship between surface water, groundwater and rainfall is a particularly area and requires consideration to respond and other groundwater quality studies. The attached average rainfall map can be used to make general deductions about the possible link between the above-ground water surface features. Climate has an effect on the quantity and quality of groundwater recharge. At sites low in the hills and along water courses, there is a high probability of groundwater derived under most conditions. In areas with unconfined shallow aquifers groundwater pumping near the rivers may result in the reverse water flow from the river towards the groundwater and result in decreased river flow. These maps provide preliminary information for more detailed groundwater and surface water studies.



AQUIFER TYPE	PROSPECTIVITY (of the State)	ROCK GROUPS	VULNERABILITY TO POLLUTION
POROUS (INTERGRANULAR)	HIGH	Quaternary aeolian deposits marginal to the coast consisting of fine to medium grain size sand.	High.
POROUS (INTERGRANULAR)	MODERATE-HIGH	Quaternary coastal plain deposits consisting of sand, silty sand, silt and clay deposits and gravel underlying areas near the coast. Includes marine loess.	Moderate to high. Depends on permeability of the material that overlies the aquifer.
POROUS (INTERGRANULAR)	LOW-MODERATE	Quaternary alluvium (silt, sand and gravel with varying clay content) and late glacial deposits.	Low to high. Low where clay material overlies aquifer. High where there is no clay.
POROUS (INTERGRANULAR)	LOW-HIGH	Tertiary sandstones, clay sand and gravel of non-marine origin (lacustrine alluvial deposits). Minor interstratified marine loess. Variable thickness up to several hundred metres.	Low to high. Low where clay overlies aquifer. High where gravel aquifers come to the surface.
FRACTURED ROCK (intergranular on some horizons)	HIGH	Permian, quartzose and lithic sandstones, mudstone, minor coal. Tertiary origin (R, Rv, Rv).	High unless a layer of low permeability material overlies the aquifer.
FRACTURED ROCK	MODERATE-HIGH	Permian mudstones, shales and sandstones (often pebbly), minor limestone, conglomerate and siltstone. Many marine origin (P).	Very high - unless a layer of low permeability material overlies the aquifer.
FRACTURED ROCK	HIGH	Tertiary basalt.	High. Very occasionally deep clay soils may offer some protection and lower vulnerability.
FRACTURED ROCK	MODERATE	Jurassic - Silurian. Tertiary basalt - St Marys. Tertiary basalt - Scottsdale, Ringarooma, Tamar and Brown Creek.	Moderate. Can be high if fractured zones are not overlain by low permeability material.
FRACTURED ROCK	LOW	Devonian granitic rocks. Cambrian mafic ultramafic complexes (pentecite, nepheline, diorite dykes). Precambrian granite.	Low to moderate. Can be high if highly fractured zones are covered by clay.

**GROUNDWATER FEATURE**  
Feature type — Yield  
Borehole accuracy — Accuracy - TDS

**GROUNDWATER FEATURE TYPE AND ACCURACY**  
Borehole location accuracy: 1-500 metres, 500-2000 metres, 2000-5000 metres, 5000-20000 metres, Well, dug well location accuracy 1-500 metres, Well, dug well location accuracy 500-2000 metres.

**BOREHOLE YIELD**  
Litres / second Potential usage of groundwater based on borehole yield  
Unknown, 0 (Dry), < 0.05, 0.05 - 0.5, 0.5 - 1.5, 1.5 - 5.0, 5.0 - 10.0, > 10.0

**SALINITY - TDS**  
Milligrams / litre  
Unknown, < 500, 500 - 1000, 1000 - 1500, 1500 - 3000, 3000 - 7000, > 7000

**POTENTIOMETRIC CONTOURS**  
Tertiary aquifers (5m contour interval), Potential surface contours (10m contour interval), Great Forester River Catchment (INE Tasmania), Great Forester River Catchment (INE Tasmania), Tertiary age deep level - position approximate Great Forester River Catchment (INE Tasmania)

**SALINITY CONTOURS**  
Salinity contours of deeper Tertiary Aquifers (500 mg/L contour interval), Longford Area (Geological Bulletin 59)

**GEOLOGY (TASMANIA / PERMAN)**  
Undifferentiated Tertiary sediments (P), Upper Triassic sandstones - shales and shales, Devonian mudstone and coal measures (P), Lower Triassic sandstones - shales and shales, Permian sandstones (P)

**GROUNDWATER QUALITY Expressed as Total Dissolved Solids (TDS)**  
TDS in mg/L: < 500, 500 - 1000, 1000 - 1500, 1500 - 3000, 3000 - 7000, > 7000

**Potential usage of groundwater based on water quality**  
All purposes, domestic and irrigation; Most purposes, upper limit for drinking, limited irrigation; Most purposes, general upper limit for irrigation; All livestock, very limited irrigation; Most livestock (not pigs or horses); Limited stock use (beef cattle, sheep)

**MEAN ANNUAL RAINFALL**  
3300mm, 3000, 2500, 2000, 1500, 1000, 500

**INDEX TO ADJOINING MAP SHEETS**

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