

# MAP 3 – 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 mainly supplied by drillers and from locations in the field by MRT staff. There are many open bore holes 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 >0.03 L/s have been considered as successful boreholes. Outputs of boreholes are those supplied by drillers and are mostly the result of short term pumping measurements. Some boreholes have been successful but outputs have not been reported. Boreholes reported as dry holes usually have a small unreported yield (<0.03 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 siltstone, mudstone 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 geological 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 body and the relationship between surface water, groundwater and rainfall) is a particular area are important considerations in recording and other groundwater water studies. The attached average rainfall map can be used to make general deductions about the possible link between the above-mentioned water balance factors. Climate has an effect on quantity and quality of groundwater and surface water. At least low in rainfall and spring water is largely, if not all 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 rivers 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 (Value of Tasmania)	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, clayey sand, silt, silty deposits and gravel underlying areas near the coast. (Includes marine silt).	Moderate to high. Depends on permeability of the material that overlies the aquifer.
POROUS (INTERGRANULAR)	LOW-MODERATE	Quaternary alluvium (clay, sand and gravel with varying clay content) and later boulder deposits. Sand gravel and mud of alluvial, lacustrine and fluvial origin. Minor windblown sands on rising bedrock.	Low to high. Low where clay material overlies aquifer. High where there is no clay.
POROUS (INTERGRANULAR)	LOW-HIGH	Tertiary sedimentary clay and gravel of non marine origin (lacustrine alluvial deposits). Minor interstratified Pleistocene mudstone, silt, quartzite and dolomite. Neoproterozoic sandstone.	Low to high. Low where clay overlies aquifers. High where gravel aquifers come to the surface.
FRACTURED ROCK (Irregularity of some horizons)	HIGH	Triassic, quartzite 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, siltstone and sandstone (often pebbly), minor limestone, conglomerate and siltite. Many main range (P).	Very high - unless a layer of low permeability material overlies the aquifer.
FRACTURED ROCK	HIGH	Devonian to Devonian turbidite sequence of sandstone and mudstone (Marianne Supergroup). Devonian limestone, Cambrian volcanics and sediments. Neoproterozoic mudstone, slate, quartzite and dolomite. Neoproterozoic sandstone.	High. Very occasionally deep clay silt may offer some protection and lower vulnerability.
FRACTURED ROCK	MODERATE	Tertiary basalt.	Moderate. Can be high if fractured zones are not overlain by low permeability material.
FRACTURED ROCK	LOW	Jurassic dolomite. Triassic basalt. St Marys. Tertiary basalt - Scottsdale, Ringarooma, Tamar and Brown Creek.	Low to moderate. Can be high if highly fractured zones are not covered by clay.
FRACTURED ROCK	LOW-MODERATE	Devonian granitic rocks. Cambrian mafic ultramafic complexes (pentrite, serpentinite, diorite etc.). Neoproterozoic granite.	Low to moderate. Can be high if highly fractured zones are not covered by clay.

**GROUNDWATER FEATURE**  
Feature type: Yield and accuracy. Legend: Yield (solid line), Accuracy (dashed line).

**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, 500-2000 metres, 2000-5000 metres, 5000-20000 metres.

**BOREHOLE YIELD**  
Litres/second. Potential usage of groundwater based on borehole yield. Legend: 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. Legend: Unknown, <= 300, 300 - 1000, 1000 - 1500, 1500 - 3000, 3000 - 7000, > 7000.

**POTENTIOMETRIC CONTOURS**  
Legend: Tertiary aquifers (5m contour interval), Potentiometric surface contours (10m contour interval), Great Forester River Catchment (NE Tasmania), Great Forester River Catchment (NE Tasmania), Tertiary age deep lead - position approximate (Great Forester River Catchment (NE Tasmania)).

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

**MEAN ANNUAL RAINFALL**  
Scale: 1:100000. Legend: 500, 1000, 1500, 2000, 2500, 3000, 3500 mm.

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

**Potential usage of groundwater based on water quality**  
Legend: 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; All livestock, limited irrigation; Limited stock use (beef cattle, sheep).

**INDEX TO ADJOINING MAP SHEETS**  
Map 3 is part of a series of maps covering Tasmania. The index shows the location of Map 3 relative to other maps in the series.