

ALBANY HINTERLAND

PROSPECTIVE GROUNDWATER RESOURCES

SHM Hydrogeological Map Series 12

This map shows the location and salinity of prospective groundwater resources within the King River, Kalgan River, Manypeaks and Nanarup areas in the Albany hinterland. The water resources are stored within infilled palaeochannels and overlying sediments.

The map shows the potential for fit-for-purpose groundwater supplies across the Albany hinterland area. To access groundwater at a local scale, proponents will need to collect site specific information to confirm that groundwater volumes and quality are suitable for their needs, and that groundwater can be taken sustainably.

MAP DEVELOPMENT

This map is a product of the South Coast groundwater investigation project, made possible by the Government of Western Australia's Royalties for Regions program.

To develop the map, the project gathered new data from an airborne electromagnetic survey and from exploratory drilling at 16 new sites. A depth to basement layer was developed from the new data and synthesised with regional scale digital elevation models, drilling reports, expert knowledge and various other sources.

All information used to compile the map is available from the Water Information Reporting portal on the department's website at www.wir.water.wa.gov.au. Spatial datasets including the depth to basement layer can be accessed here: spatial.data@water.wa.gov.au.

The method used to produce this map is described in the explanatory notes (Ryan et al. 2017).



HINTERLAND MAP AREA

WATER RESOURCE MANAGEMENT

The Department of Water is responsible for managing the state's water resources. Under the *Rights in Water and Irrigation Act 1914*, the department protects the state's water resources and promotes their sustainable and efficient use using mechanisms including science, policy, planning, licensing and monitoring. A licence to construct wells or take water may be required to access groundwater resources in the Albany hinterland. For more information contact our regional office or visit our website at:

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RECOMMENDED REFERENCE FOR THIS MAP

Ryan, SA, Yesertener, C, Maughan, A and Thornton, H 2017, *Albany hinterland prospective groundwater resources map*, Department of Water, Hydrogeological map series, map no. SHM12, Western Australia.

REFERENCES

Ryan, SA, Yesertener, C, and Maughan, A, 2017, *Albany hinterland prospective groundwater resources map – explanatory notes*, Department of Water, Hydrogeological map series HM 12, Western Australia.

DISCLAIMER

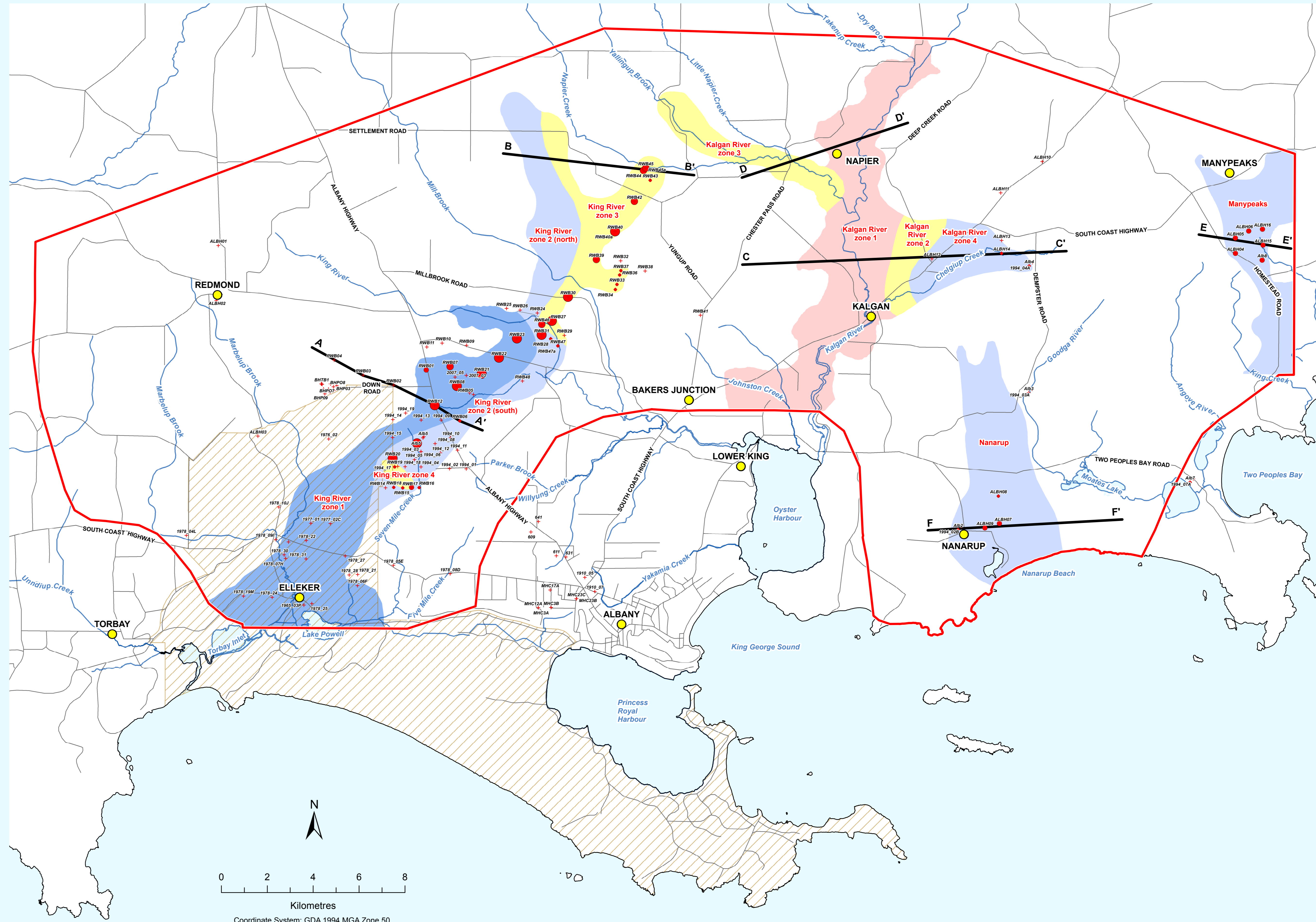
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UNITS OF MEASUREMENT

| | |
|--|---|
| Salinity mg/L milligrams per litre TDS total dissolved solids | Depth m bgl metres below ground level m AHD metres Australian Height Datum |
| Volumes of water 1 litre (L) 1 litre 1 kilolitre (kL) 1000 litres 1 megalitre (ML) 1 000 000 litres 1 gigalitre (GL) 1 000 000 000 litres | Conversion of kilolitres per day to litres per second 10 kL/d 0.1 L/s 100 kL/d 1.2 L/s 500 kL/d 5.8 L/s 1000 kL/d 11.6 L/s |

GUIDE TO MAIN FEATURES AND USE OF THE MAP

- On the map below prospective groundwater resources in the King River, Kalgan River, Manypeaks and Nanarup areas are colour coded into salinity zones. The salinity zone will help determine the suitability of each resource as described in the salinity categories table.
- The red dots on the map show estimated airlift yields calculated during bore drilling. Estimates can be a guide to potential yield for production bores.
- The hydrogeological information table summarises information for each resource zone, including broad estimates of annual recharge. This can be used to guide assessment of sustainable abstraction volumes.
- The cross section diagrams show the distribution of palaeochannels, minor sedimentary aquifers, groundwater elevations, salinity and airlift rates, and can be used to guide drilling depths.



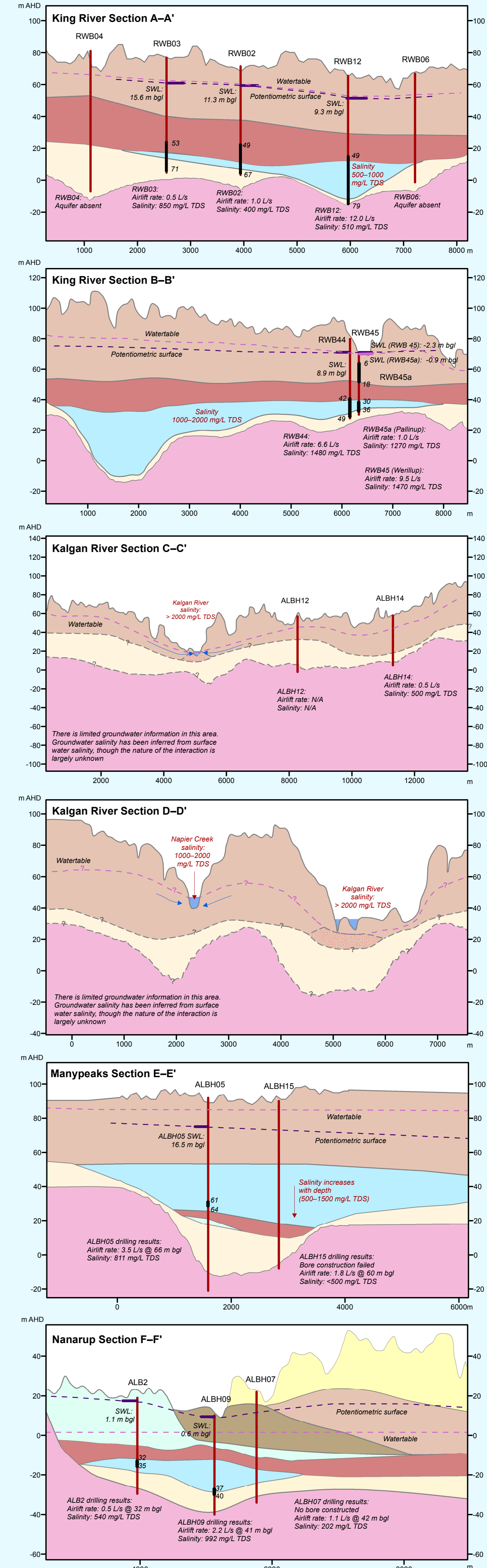
SALINITY CATEGORIES

The department categorises salinity into five broad ranges, shown below, that indicate the suitable fit-for-purpose use. Higher salinity water can often be utilised if appropriate technologies, crop selection and farming techniques are applied. The salinity categories are explained in more detail in the Department of Water's *Water resource inventory 2014*, available from: www.water.wa.gov.au

The salinities shown in this map are based on groundwater samples from bores and surface water samples from rivers. Salinity is measured in milligrams per litre of total dissolved solids (mg/L TDS). Salinity varies across a groundwater resource depending on location within the aquifer and the time of year.

| | | | | | |
|----------------------------|----------------------------|----------------------------------|-----------------------------------|-----------------------------------|------------------------------------|
| | Fresh 0–500 mg/L TDS | Marginal 500–1000 mg/L TDS | Brackish 1000–3000 mg/L TDS | Saline 3000–35 000 mg/L TDS | Hypersaline >35 000 mg/L TDS |
| Potable water - desirable | [Color swatches] | | | | |
| Potable water - acceptable | [Color swatches] | | | | |
| Irrigation | [Color swatches] | | | | |
| Industry | [Color swatches] | | | | |

CROSS SECTIONS



Cross section legend

| | |
|----------------------------------|-------------------------------|
| Hydrostratigraphy | Screen interval |
| Surficial aquifer | Bore or well |
| potential unknown | Surface water |
| Pallinup aquifer | Water table |
| minor, fresh | Potentiometric surface |
| minor, saline | Static water level – Pallinup |
| Pallinup aquitard | Static water level – Werillup |
| confining layer | Uncertain |
| Werillup aquitard | |
| confining layer | |
| Werillup aquifer | |
| palaeochannel, fresh to marginal | |
| minor local, potential unknown | |
| Basement | |
| weathered clay | |
| fresh granite | |

HYDROGEOLOGICAL INFORMATION

| Resource zone and area name | Cross section | Aquifer | Lithology | Area (km ²) | Saturated thickness (m) | Storage (GL) | Recharge range (GL/year)* | Salinity (mg/L TDS) |
|--------------------------------|-------------------|-----------------|--------------------------------|-------------------------|-------------------------|--------------|---------------------------|---------------------|
| King River zone 1 | A-A' | Werillup | sand | 50 | 19 | 190 | 1.5–5.6 | <500 |
| King River zone 2 (north) | A-A' | Werillup | sand, minor clay | 15 | 20 | 60 | 0.1–1.2 | 500–1000 |
| King River zone 2 (south) | B-B' | Werillup | sand | 12 | 7 | 16.8 | 0.1–1.0 | 500–1000 |
| King River zone 3 | B-B' | Werillup | sand, clay, lignite | 16 | 11 | 35.2 | 0.1–0.4 | 1000–3000 |
| King River zone 4 | B-B' | Werillup | sand, minor clay | 1 | 15 | 3 | 0.0–0.02 | 1000–3000 |
| King River area total | A-A'; B-B' | Werillup | | 94 | | 305 | 1.8–8.2 | |
| Kalgan River zone 1 | C-C' | Pallinup | sand, silt | 48 | 15 | 72 | 0.1–0.7 | >3000 |
| Kalgan River zone 2 | C-C' | Pallinup | sand, silt | 6 | 15 | 9 | 0.0–0.1 | 1000–3000 |
| Kalgan River zone 3 | D-D' | Pallinup | sand, silt | 11 | 15 | 16.5 | 0.0–0.2 | 1000–3000 |
| Kalgan River zone 4 | C-C' | Pallinup | sand, silt | 10 | 15 | 15 | 0.1–0.4 | 500–1000 |
| Kalgan River area total | C-C'; D-D' | Pallinup | | 75 | | 112.5 | 0.2–1.3 | |
| Manypeaks area total | E-E' | Werillup | sandstone; minor sand and silt | 20 | 35 | 105 | 0.7–1.3 | 500–1000 |
| Nanarup area total | F-F' | Werillup | silty sand | 30 | 8 | 48 | 1.2–1.7 | 500–1000 |

* recharge is presented as a range in gigalitres per year and shows broad estimates of the minimum and maximum recharge volumes.