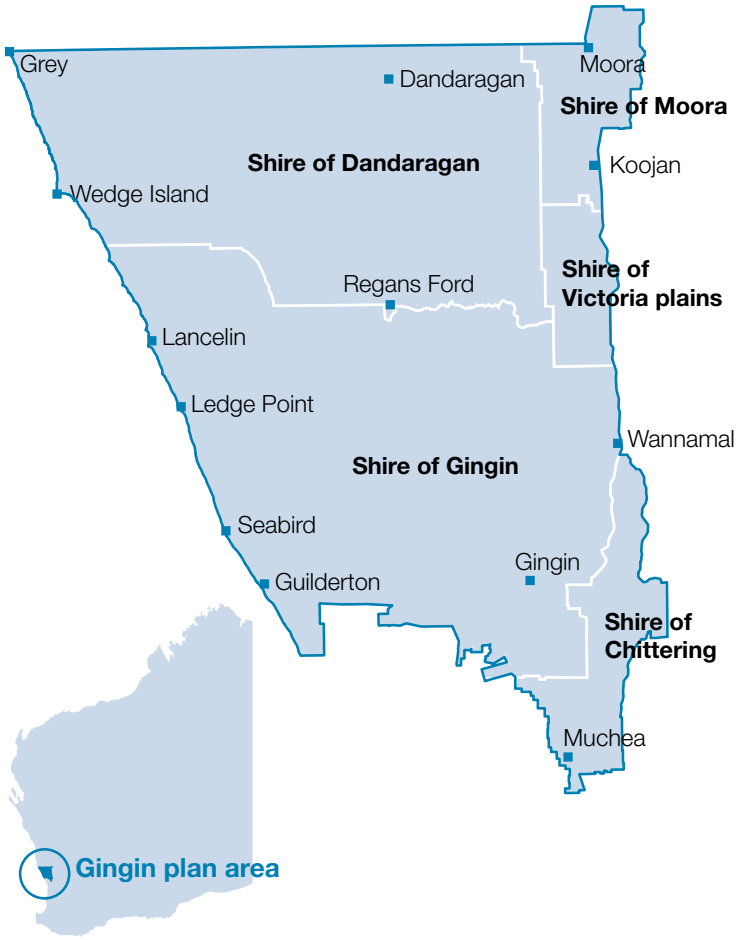
Managing groundwater in the Gingin area

Groundwater use in the Gingin area is continuing to grow, especially for irrigated agriculture and horticulture.

Agriculture and horticulture have expanded and increased in value in the Gingin plan area over time. In 1998, these industries were worth $56 million. This increased to $115 million in 2006 and in 2013 vegetable production alone was estimated at $158 million. This trend will likely continue as businesses from the Gnangara area move northwards due to increasing pressures from Perth's expanding urban areas.



Where does the water come from?

The proclaimed Gingin groundwater area covers about 6000 km^2 of the Northern Perth Basin and extends from north of Two Rocks and Muchea in the south to Grey and Moora in the north. Groundwater is sourced from nine aquifers, with most licensees abstracting water from the shallow Superficial aquifer, or the deeper Leederville, Yarragadee and Leederville-Parmelia aquifers.

The hydrogeology of the area (as shown in Figure 1) is well understood. Shallow aquifers are recharged directly from rainfall, or in some areas from underlying aquifers where water is under pressure. The deeper aquifers are recharged by percolation from overlying shallow aquifers, or from rainfall and flow from outside the plan area.

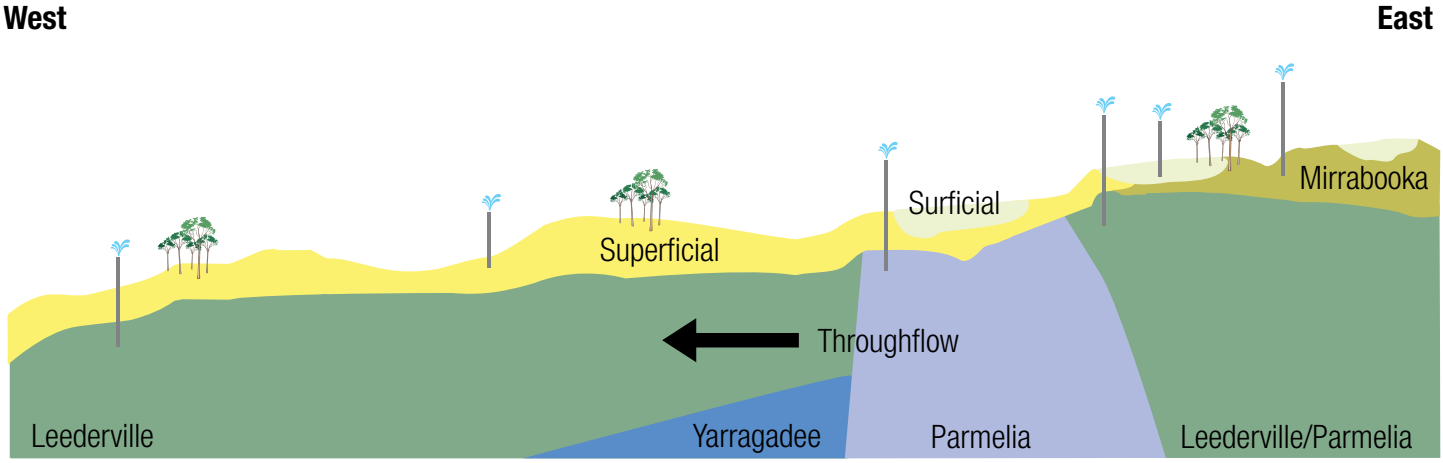


Figure 1 – Hydrogeological cross section of groundwater in Gingin

How is water managed in the Gingin plan area?

The Department of Water regulates and manages groundwater resources in the Gingin area in accordance with the *Gingin groundwater allocation plan* (Gingin plan). Released in April 2015, the Gingin plan outlines how water can be abstracted for productive use, while also ensuring the long-term viability of aquifers and protecting important groundwater-dependent ecosystems in the area.

The Gingin plan is complimentary to the *Gingin surface water allocation plan*, which outlines how surface water can be abstracted from Gingin Brook, and the *Gnangara groundwater areas allocation plan* that covers groundwater resources south of Gingin Brook.

The Gingin plan area is divided into 25 subareas to administer water allocation and licensing. Within these subareas there are allocation limits for 35 individual groundwater resources. A total of 235 GL per year (gigalitres) is available from these resources each year for use. The department issues water licences in each resource up to the allocation limit in accordance with the *Rights in Water and Irrigation Act 1914* and the local licensing policies in the Gingin plan.

In subareas where no more groundwater is available, trading is the way to access additional volumes of water. In some cases, trades may not be allowed as the risk is too high to groundwater levels, groundwater-dependent ecosystems such as Gingin Brook and productive use. The Gingin plan outlines how we will assess trades.

Some areas are already over-allocated. We aim to recover groundwater resources in these areas to ensure that the resource remains a viable water source into the future and continues to support groundwater-dependent ecosystems. This will be done through recouping of unused water entitlements in line with the department's Statewide Policy No. 11 – *Management of unused licensed water entitlements*.

We will continue to adapt management of groundwater resources in the Gingin area using data from an extensive monitoring network and scientific assessment of how the resource is performing over time.

Securing long-term water availability in Gingin

A critical factor influencing water availability in the Gingin groundwater area is climate change. Since the mid-1970s, the south-west of Western Australia has been affected by marked declines in rainfall and groundwater recharge. In the Gingin area, this has contributed to declines in groundwater levels in many aquifers and reduced flow in Gingin Brook and Moore River.

When developing the *Gingin groundwater allocation plan* we used the most up-to-date projections of future rainfall from the CSIRO to set allocation limits with a high level of reliability.

To ensure that there is sufficient water to meet the needs of growing local communities and provide a potential future water source option for Perth, we have reserved a total of 41 gigalitres for future public water supply.

Managing surface water–groundwater interaction

There is a complex relationship between groundwater and flow in Gingin Brook. The department has completed studies to assess this relationship and the results show that groundwater in the Mirrabooka and Leederville–Parmelia aquifers is critical for maintaining flow, particularly in summer.

We used this understanding to set allocation limits and licensing and trading policies in the *Gingin groundwater allocation plan* to protect flow in both Gingin Brook and Moore River. The department's monitoring network, which includes streamflow gauging stations, will continue to be used to refine management of both groundwater and surface water resources.

Learning more about groundwater investigations

The Gingin area is going to be an important agricultural and horticultural growth zone into the future. To support this growth, the Department of Water is committed to finding new water sources and refining its understanding of groundwater resources in the area.

We have already dedicated $4.5 million to investigating groundwater resources in the northern Gingin area to ensure that the region's water sources can be used effectively in the long-term.

A further $4.7 million has been committed to confirm groundwater availability in the Midlands area between Gingin and Dongara as part of the Royalties for Regions-funded Water for Food program. This program aims to identify precincts that may be suitable for intensive irrigated horticulture.

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