

Department of Water Government of Western Australia

Looking after all our water needs

# Protecting groundwater resources of Western Australia to ensure safe drinking water supplies

K.L. Buehrig, F.R. Guest and K.J. Ketteringham

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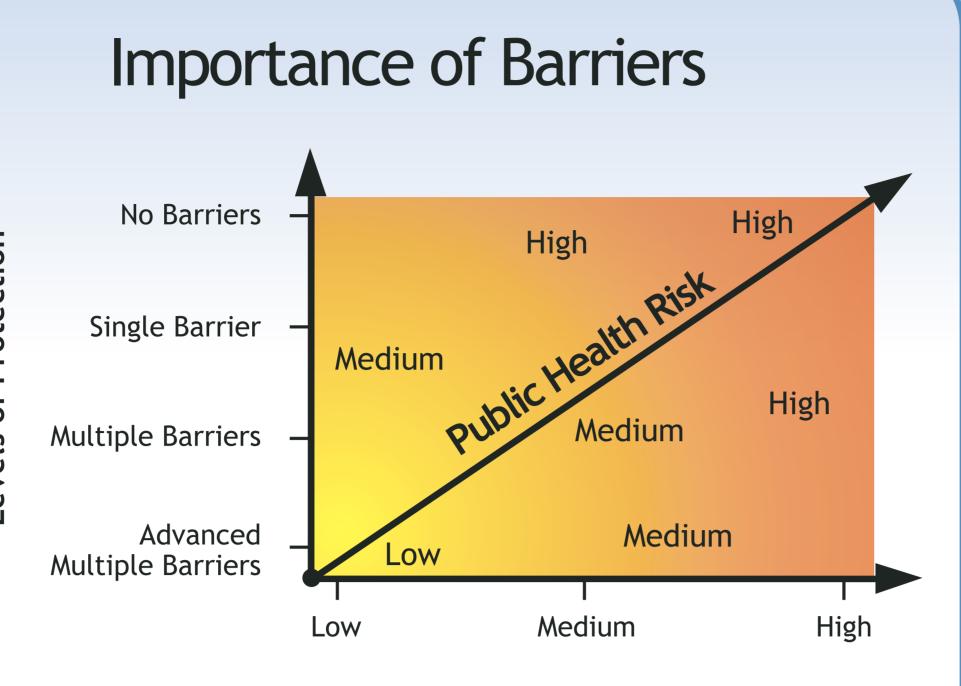
### Australian Drinking Water Guidelines



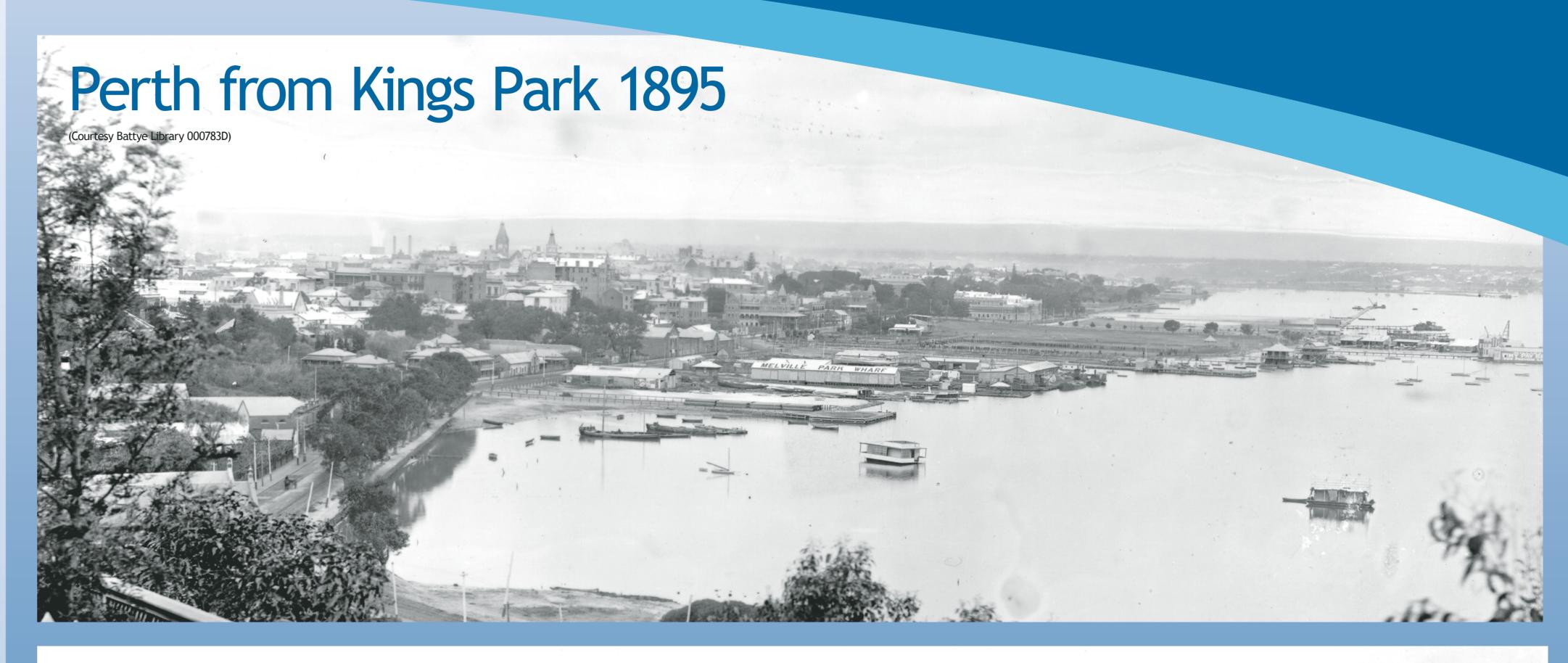
Western Australia's (WA) level of drinking water source protection is strongly influenced by its commitment to implement the Australian Drinking Water Guidelines (ADWG); most specifically the 'catchment to

consumer' risk-based, multiple barrier approach to protecting Public Drinking Water Source Areas (PDWSA). Barriers include catchment protection, water storage and treatment. The importance of maintaining multiple barriers can be seen here. The guidelines outline 12 elements as part of a framework for protecting PDWSA. Elements 2 and 3 are implemented by the Water Source Protection Branch at the Department of Water.

Element 2: Assessment of the drinking water supply system is implemented through the preparation of Drinking Water Source Protection Assessment (DWSPA) documents while Element 3: Preventative measures for drinking water quality management is directly addressed via the preparation of Drinking Water Source Protection Plans (DWSPP).



Level of Activity in Drinking Water Catchments



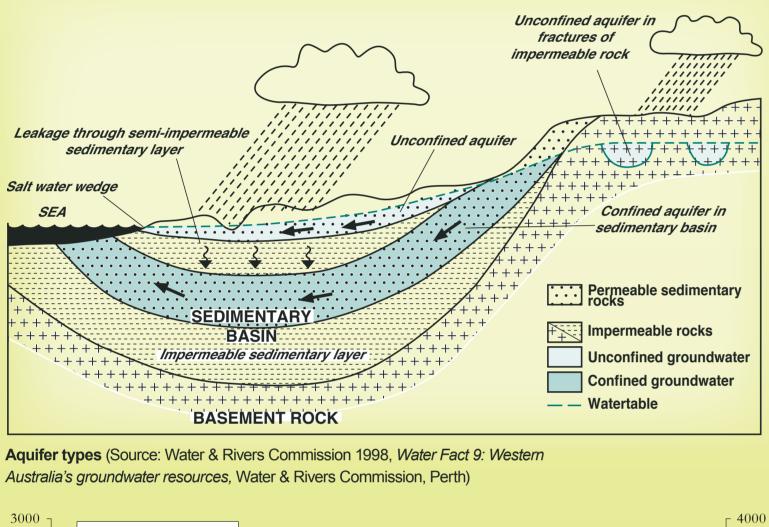
#### Perth from Kings Park 1955 (Courtesy Battye Library 011911D)

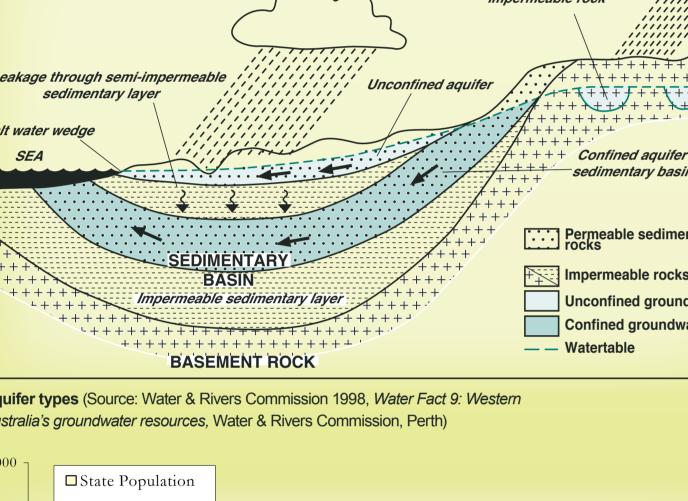
(Source: Department of Water)

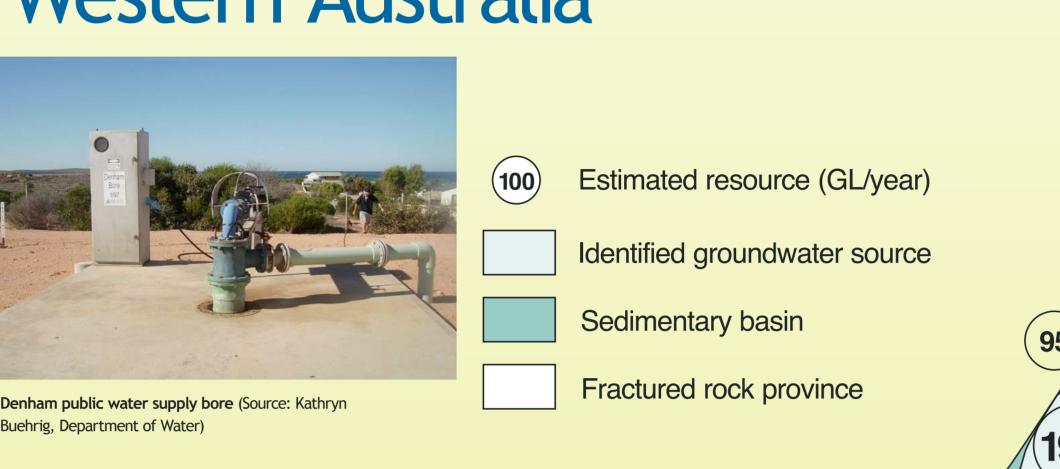
# Groundwater in Western Australia

 Accounts for about threequarters of all water used.

- Makes up 60% of Perth's drinking water supply.
- WA's largest bodies of groundwater are sedimentary basins covering 40% of the state.
- Perth's shallow sand and karstic limestone sediments allow an easy path for contaminants to enter groundwater.
- As Perth's groundwater demand increases, so does the potential for groundwater contamination, which may prevent economic growth in WA



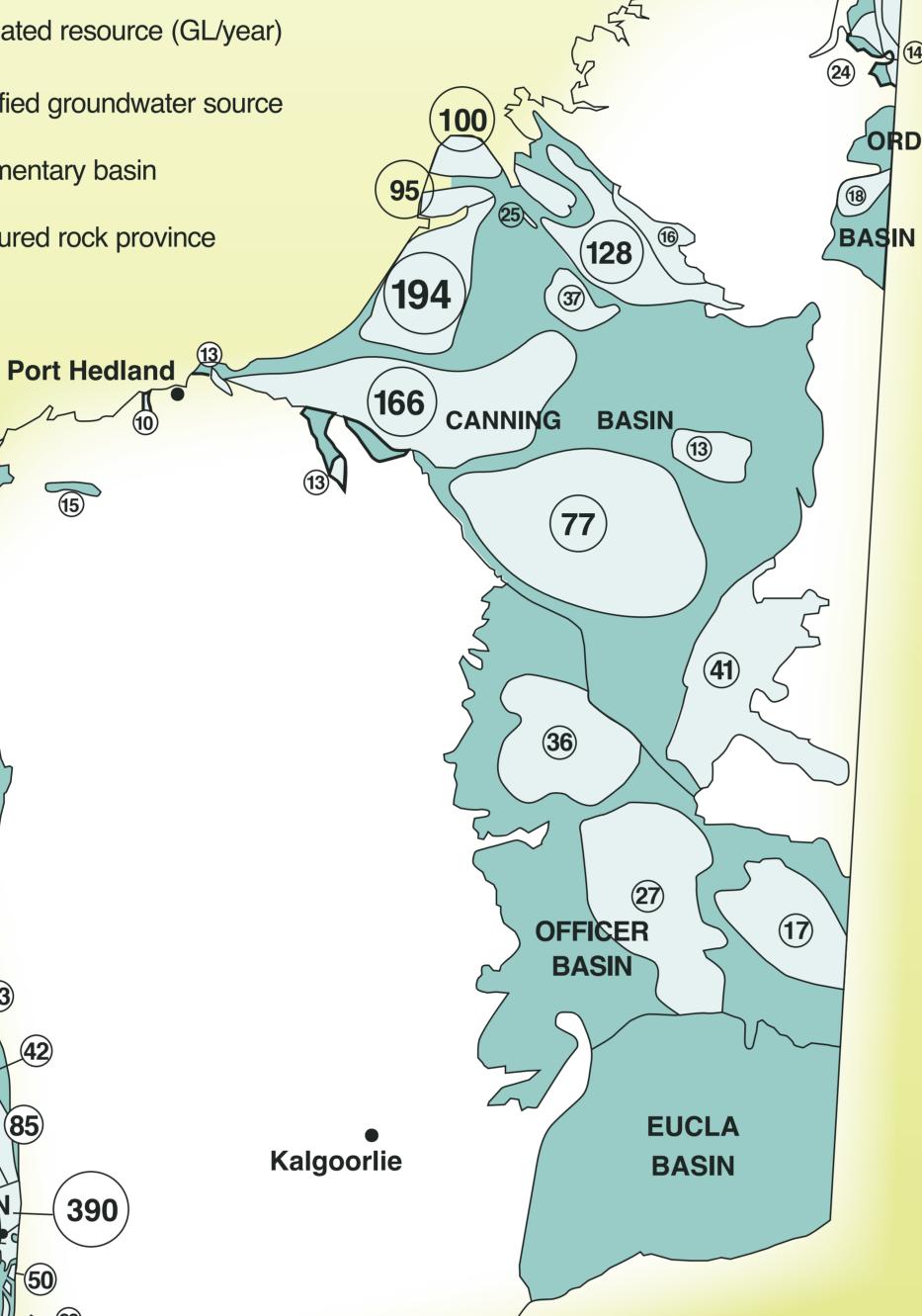


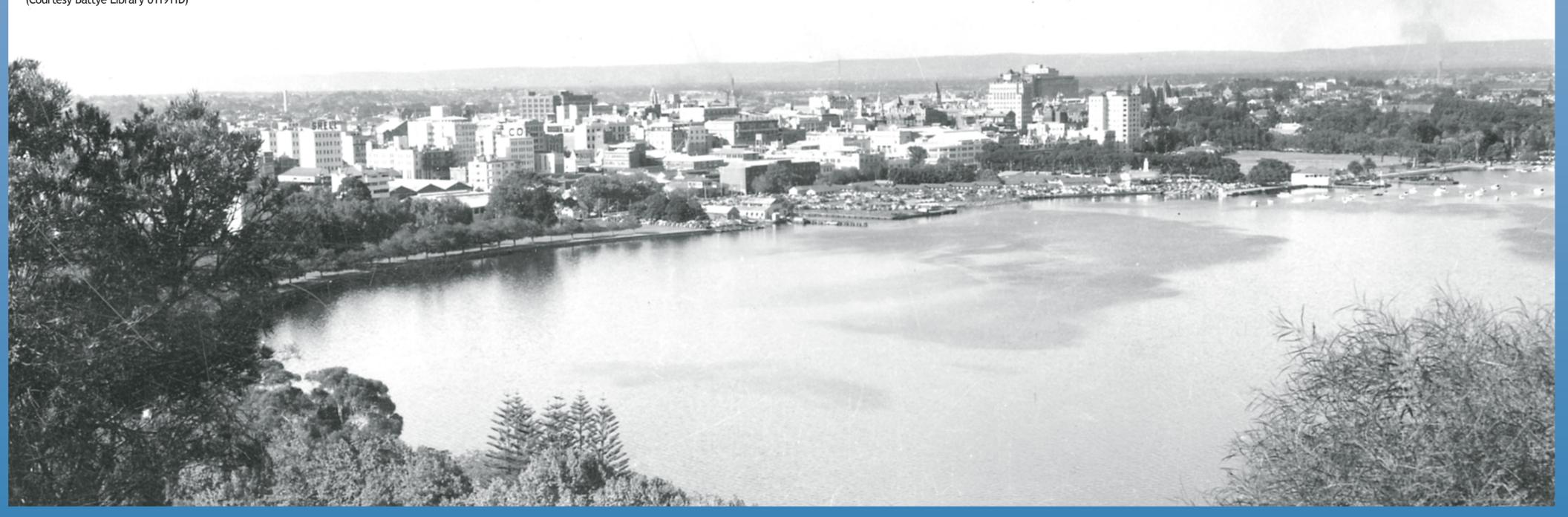


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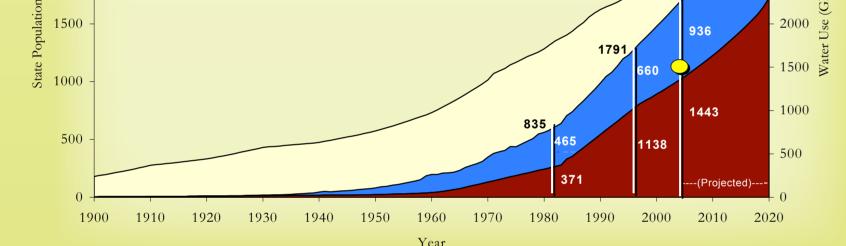




Perth from Kings Park 2007



Groundwater is a critical resource for WA. The ready availability to manage and protect groundwater for current and the future of shallow groundwater would have been instrumental in the generations. initial settlement of Perth in the early 1800s. In 2006 WA's The Department of Water protects this resource through population was just under two million and almost three quarters legislation, DWSPP and land-use planning. The department aims thereof was concentrated around the Perth metropolitan region. to ensure the future quality of the state's public drinking water With a continued drying climate and an increasing population, supplies by maintaining a close relationship with stakeholders there is a growing dependence on groundwater. In order to and the public and progressing the proposed changes to the maintain safe, good quality drinking water, we need to continue water resources legislation.



**COLLIE BASIN** BREMER BASIN 400 km

Historical water use and demand projections (Note: desalination and recycled sources have not been included) (Source: Wate Assessment Branch, Department of Water, 2006, Groundwater Investigation Program in Western Australia (2005 to 2020) HG 10).

Location and estimated renewable yields of major known and inferred groundwater sources (GL/yr of groundwater less than 1500 mg/L TDS) (Source: Allen A.D., Laws, A.T., Commander D.P., 1992, A review of the major groundwater resources in Western Australia, Report to Kimberley Water Resources Development Office, December 1992.)

# Legislation

Surfacewater Use

Groundwater Use

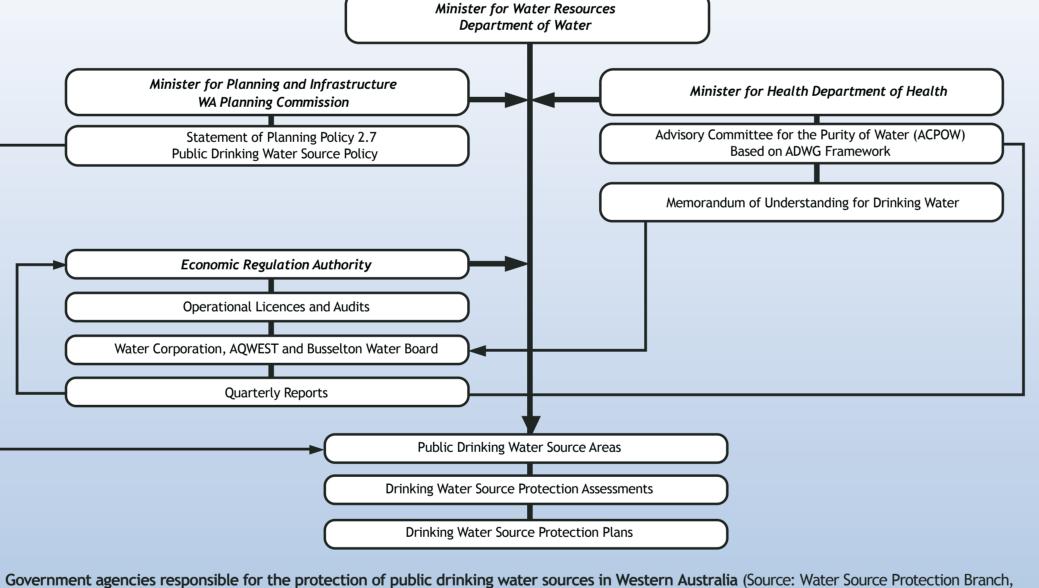
The two most important acts addressing groundwater PDWSA are the *Metropolitan Water* Supply Sewerage and Drainage Act 1909 (MWSSD Act) and the Country Areas Water Supply Act 1947 (CAWS Act), both

managed by the Department of



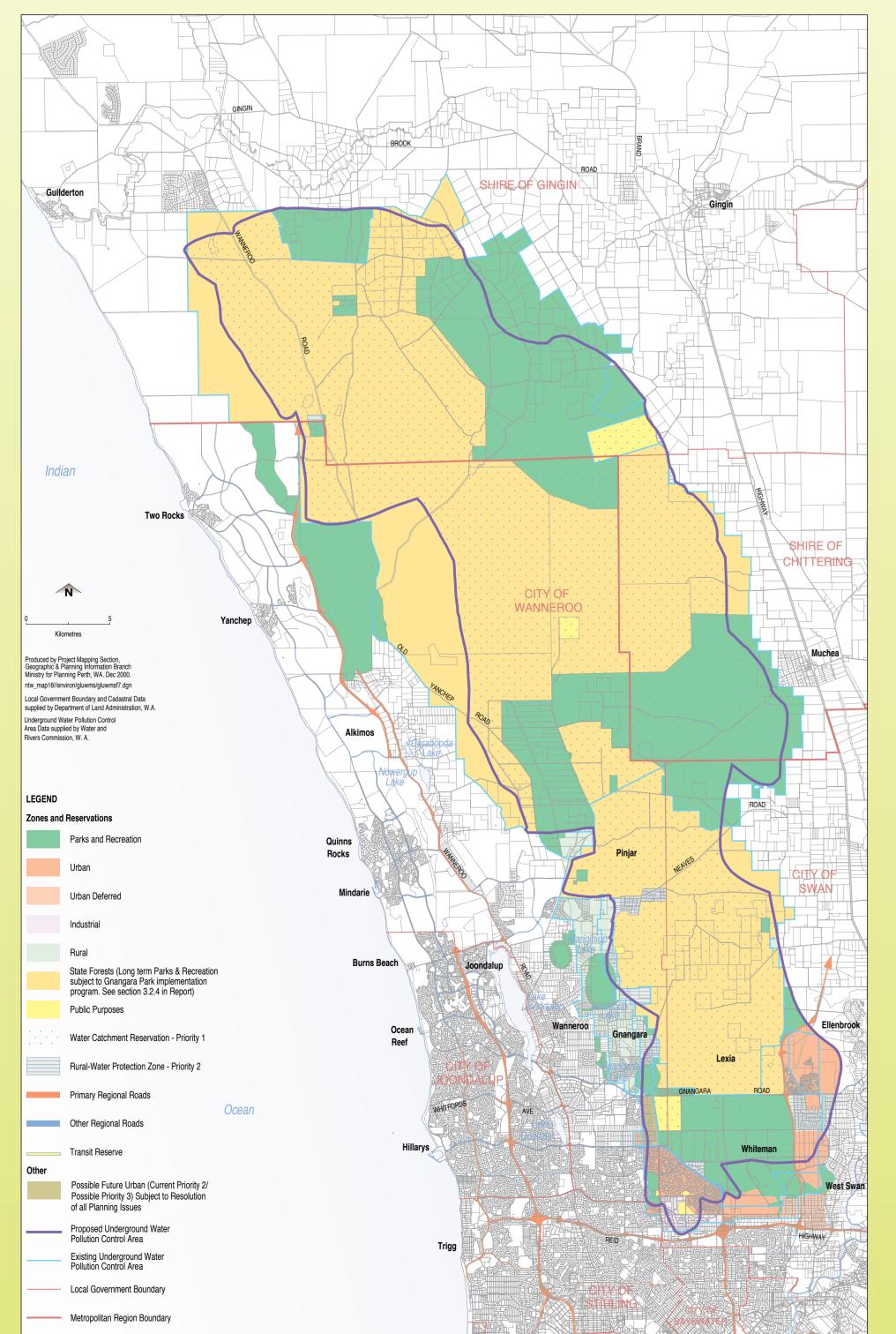
Department of Water

Water. PDWSA are proclaimed under these acts, making the relevant by-laws applicable and enforceable. Groundwater areas are proclaimed as underground water pollution control areas (MWSSD Act), or water reserves (CAWS Act).



Agencies

Department of Water)



### Land-use Planning

Good land use planning is essential for the protection of groundwater and relies on a solid decision-making framework for future developments.

State-wide planning policies ensure that planning schemes and strategies



Tour of a water supply bore (Source: Department of Water)

### **Protecting Public Drinking Water Source Areas**

The Department of Water implements the ADWG with a statewide program for protecting PDWSA.

#### Drinking Water Source Protection Assessments and Plans

Assessments provide an overview of a water source, its land uses and risks to water quality.

Plans build upon the assessment documents. They propose recommendations and strategies to address water quality risks, and are produced in consultation with the public.

Drinking Water Source Protection Plans (Source: Water Source Protection Branch, Department of Water, WA)

### Challenges

#### Climate Change

• WA is expected to increase its population from about 2 million people in 2007 to approximately 2.8 million people in 2030.

Priority Areas and Protection Zones

Three different priority areas are declared within PDWSA:

- Priority 1 (P1) areas are managed for risk avoidance.
- Priority 2 (P2) areas are operated under the principle of risk minimisation.

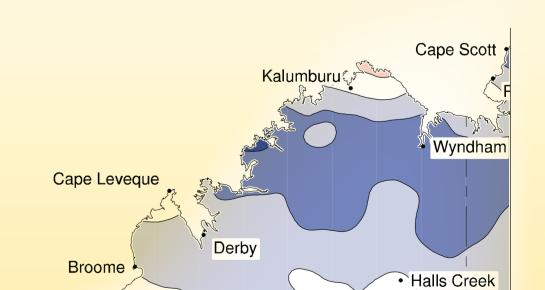
• Priority 3 (P3) areas are defined for risk management.

Sovereign Hill water reserve priority areas and protection zones (Source: Sovereign Hill Water Reserve Drinking Water Source Protection Plan, Department of Water)

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Protection zones are defined around groundwater bores that supply public drinking water. These are known as wellhead protection zones and are recognised within legislation.

Priority areas and protection zones are determined through the DWSPP for the particular drinking water source.



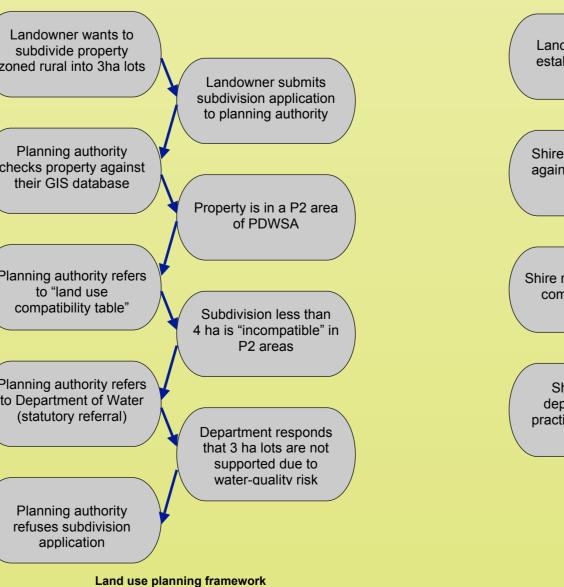
Rainfall Decile Ranges

Market Gardens

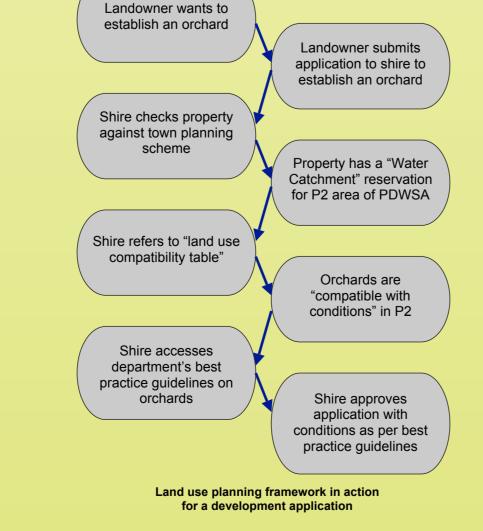
identify PDWSA as special control areas, thus ensuring their protection by shaping land-use decisions.

The Department's water quality protection note - Land use compatibility in Public Drinking Water Source Areas guides land use planning decision makers on activities that are considered "acceptable", "compatible with conditions" or "incompatible" within each of the priority areas (P1, P2 or P3) according to their level of water quality risk.

Land-use planning statutory referrals process



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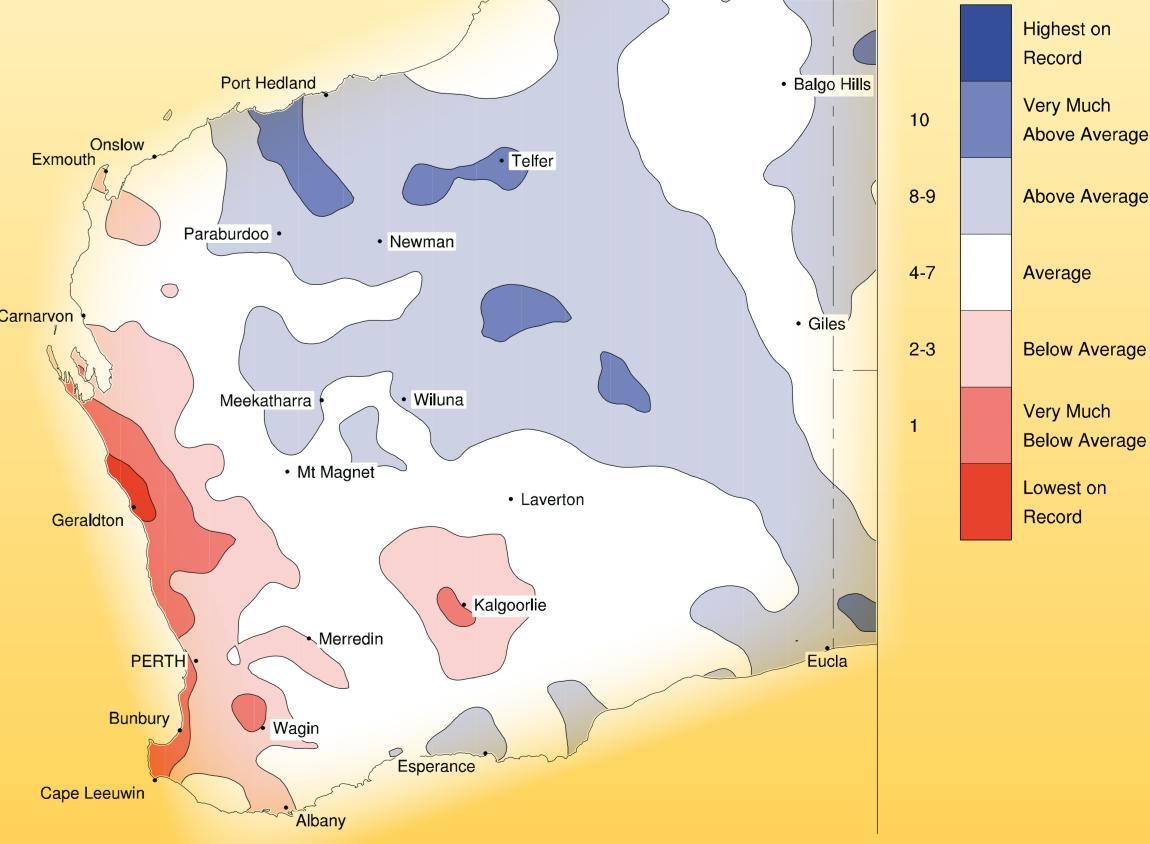
• The Indian Ocean Climate Initiative predicts more hot days and less winter rainfall in the southern part of WA, where over 90% of the population resides.

These trends point to further decreases in groundwater recharge and significant increases in water use for WA.

#### Water Law Reform

Due to the importance of water, a greater recognition is required for its economic, social and environmental value as well as finding ways to use it more efficiently and effectively. The WA Government is helping to achieve this through the proposed water law reforms. The reform has recently been given greater urgency and direction with WA's signing of the National Water Initiative in April 2006.

The water law reforms will provide stronger statutory powers for the protection of PDWSA, enabling bylaws to carry heavier penalties, greater powers of enforcement against offenders and statutory plans, priority areas and protection zones.



Western Australian Rainfall Deciles 1 November 2004 to 30 June 2007 distribution based on gridded data, product of the National Climate Centre) (Source: www.bom.gov.au 26/10/07)

> National Water Quality Management Strategy Australian Drinking Water Guidelines 2004



A detailed explanation of all elements of drinking water source protection can be obtained via our website

Zoning and Reservation Plan Gnangara Land Use and Water Management Strategy (Source: www.wapc.wa.gov.au 30/10/07).

drinkingwater.water.wa.gov.au

Australian Drinking Water Guidelines 2004