



SEABIRD WATER RESERVE WATER SOURCE PROTECTION PLAN

Seabird Town Water Supply



WATER RESOURCE PROTECTION SERIES

WATER AND RIVERS COMMISSION REPORT WRP 6 1997



WATER AND RIVERS
COMMISSION



Important information

The *Seabird water source protection plan* (1997, WRP no.6) was reviewed in 2011.

Please ensure you read the *Seabird drinking water source protection review* (2011, WRP no.120) alongside the 1997 plan to obtain all of the information about this drinking water source.

The 2011 review considers changes that have occurred in and around the Seabird Water Reserve since the completion of the 1997 *Seabird water source protection plan*. Additional recommendations have been prepared to ensure the ongoing protection of this public drinking water source area:

- amending the reduced boundary under the *Country Areas Water Supply Act 1947 (WA)*
- assessing bore construction surrounding the Seabird Water Reserve
- investigating the inclusion of bore construction requirements in the surrounding crown lease.

You can find the 2011 *Seabird drinking water source protection review* at www.water.wa.gov.au > publications > find a publication > drinking water source protection reviews or by contacting the Department of Water on +61 8 6364 7600 or drinkingwater@water.wa.gov.au.

Seabird Water Reserve
Water Source Protection Plan
Seabird Town Water Supply

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Water and Rivers Commission
Policy and Planning Division

WATER AND RIVERS COMMISSION
WATER RESOURCE PROTECTION SERIES
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Executive Summary

About the Water Reserve

Seabird is a small fishing town located about 100 kilometres north of Perth in the Shire of Gingin. Water is supplied to the town by the Water Corporation from bores in the confined Leederville formation aquifer.

As the aquifer is confined, there is minimal risk of contamination of the water source from the current residential land use within the Water Reserve.

A Priority 3 Water Reserve consisting of a 300 metre radius centred about each well should be proclaimed to protect the immediate wellhead area.

About Water Source Protection Plans

Water Source Protection Plans establish the level of protection required within Water Reserves. The plans identify sources of contamination that should be investigated and set out programs for management of the resource.

The quality of water sources in country Western Australia is protected by proclaiming Water Reserves under the Country Areas Water Supply Act (1947). The Act's by-laws enable the Water and Rivers Commission to control potentially polluting activities, to regulate land use, inspect premises and to take steps to prevent or clean up pollution.

The Water and Rivers Commission aims to work proactively with planning agencies to incorporate water protection in the land planning process. Decisions on land use zoning and subdivision applications have a significant impact on the protection of water sources. The Commission supports the amendment of Town Planning Schemes and Development Strategies that reflect land use compatible with Water Source Protection Plans.

This Water Source Protection Plan provides a basis for establishing compatible land uses within the Water Reserve at Seabird and is a mechanism for practical implementation of the Commission's protection strategies. Local government decision makers, State planning authorities and operational staff are encouraged to recognise this document as a basis for ensuring the long term protection of this groundwater resource for generations to come.



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1. Introduction

Seabird is a small fishing town located 100 kilometres north of Perth (see **Figure 1**). The town water supply is supplied from groundwater pumped from a Water Corporation wellfield. There is minimal risk of contamination of the water source as the supply is drawn from the Leederville Formation aquifer, which is confined in the vicinity of the wellfield.

The Seabird wellfield comprises two bores (1/75 and 1/83) located about 800 metres from the coast. The bores are screened between about 96 and 104 metres below ground level. Groundwater from this source undergoes aeration and filtration to remove iron and manganese prior to reticulation.

The climate of the region is described as Mediterranean with hot, dry summers and mild, wet winters. The long term average rainfall at nearby

Lancelin is 652 millimetres. Most rainfall is recorded during the winter months, from May through to October.

2. Hydrogeology

The Seabird town water supply is drawn from bores screened in the Leederville Formation. The formation comprises an interbedded sequence of sandstone, siltstone and shale. The Leederville Formation is overlain by shale and greensand of the Coolyena Group and Quaternary Tamala Limestone.

The Leederville Formation aquifer is confined in the vicinity of Seabird and has a potentiometric surface about 2 metres above ground level. The main recharge area for the aquifer in this region is about 30 kilometres to the east of Seabird where the formation subcrops. The direction of groundwater flow is westerly with groundwater discharging over a saline wedge to the ocean.



Plate 1: Coastal scrub and urban development surrounding the Seabird wellfield



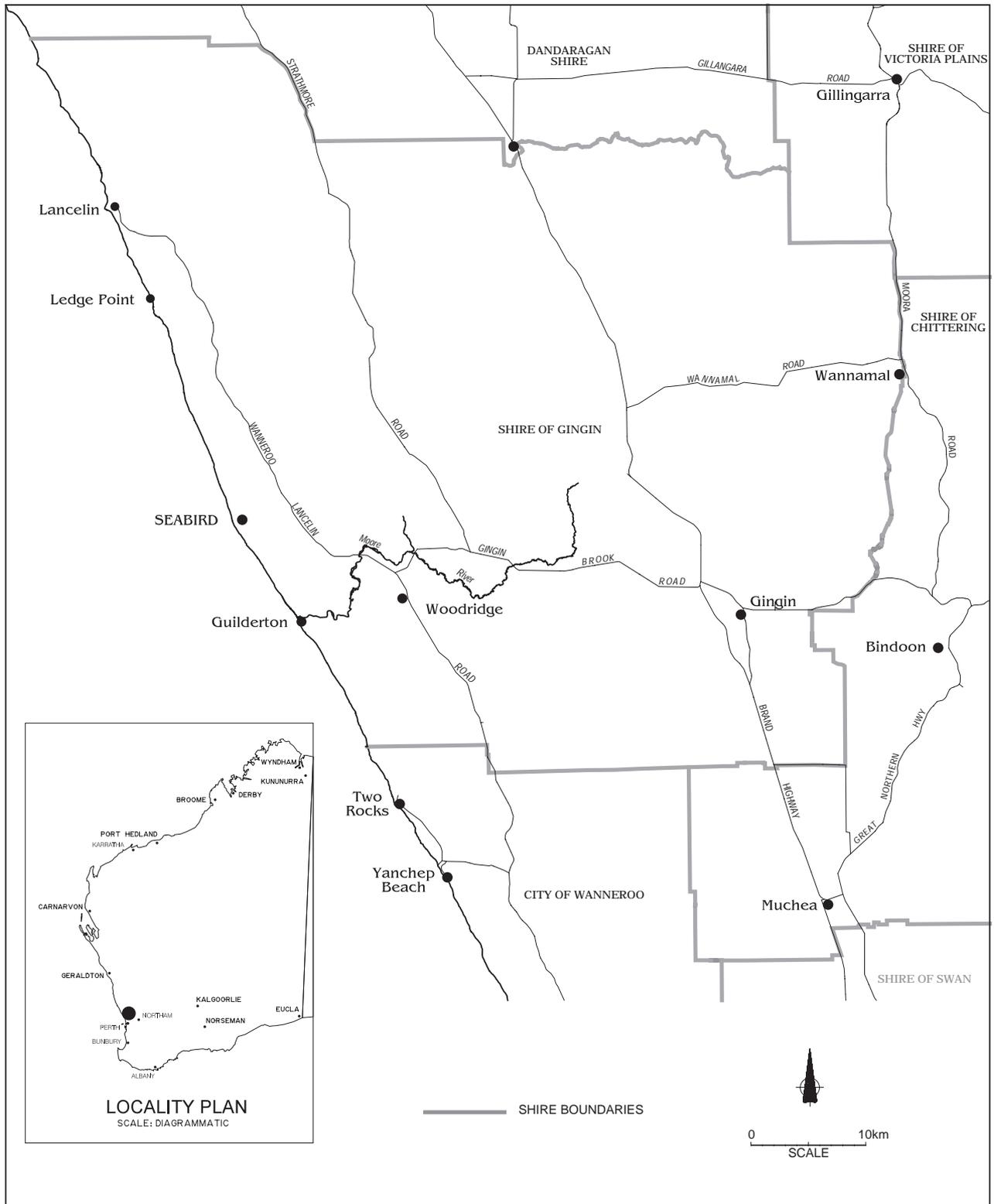


FIGURE 1. SEABIRD LOCALITY MAP



3. Land Use - Existing and Proposed

Land use adjacent to the bores comprises undisturbed coastal scrub, which is being replaced by urban development as depicted in **Plate 1**.

Land use in the recharge area 30 kilometres east of Seabird consists of broadacre cropping and the grazing of stock.

Future land use within the Water Reserve is likely to consist of urban development associated with the expansion of Seabird.

4. Potential for Contamination

There are no existing or potential groundwater contaminant threats in the vicinity of the Seabird wellfield. The Leederville Formation aquifer is overlain by a confining layer which provides a barrier to contamination.

Broadacre cropping and grazing are the main land use activities in the recharge area for the aquifer, located approximately 30 kilometres east of the wellfield. There is no foreseeable risk of contamination of the wellfield, as these non-intensive land uses have low impact on water quality.

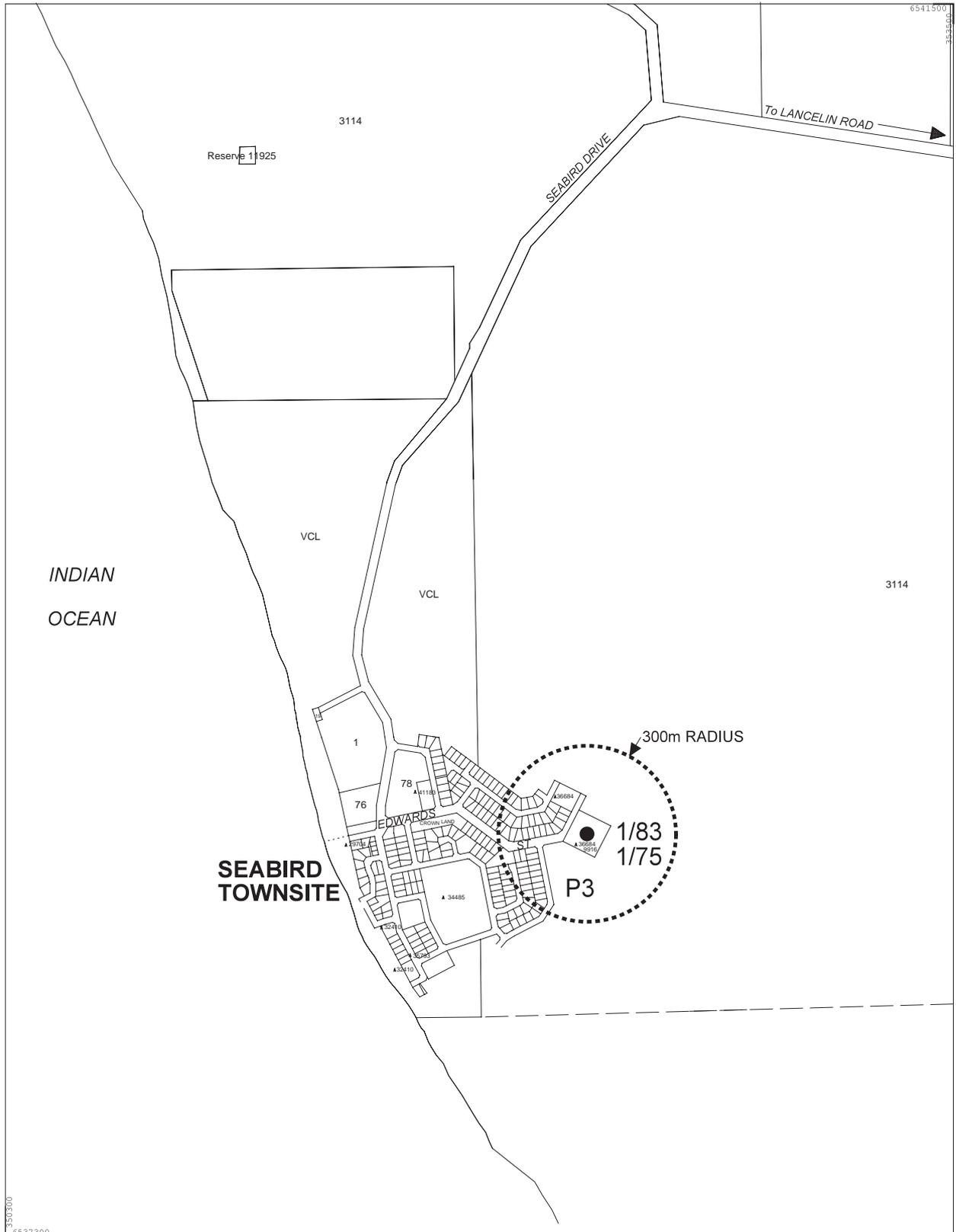
5. Proposed Proclaimed Areas

A Water Reserve should be proclaimed to protect the immediate wellhead area and should consist of a circle of 300 metre radius centred on the wellhead. This coincides with the wellhead protection zone. (see **Figure 2**).

The Water Reserve should be proclaimed as a Priority 3 (P3) water source protection area. This classification is justified based on the following criteria:

- the aquifer is confined in the vicinity of Seabird;
- significant alternative water supplies exist in the general area.





100 0 100 200 300 400 500 600 700
Metres

WATER AND RIVERS COMMISSION

LEGEND:

- P1/83 ● Production Wells
- P1/75 ● Production Wells
- Priority 3 Source Protection Area

INDEX TO ADJOINING MAPS
1:100000

1836	1936	2036
1835	1935	2035
1834	1934	2034

FIGURE 2. SEABIRD WATER RESERVE

Drawn by	D.R.A	Date:	23/05/96
Policy and Planning Branch Public Water Source Protection			



Recommendations

1. The proposed Gingin Water Reserve should be gazetted under the Country Areas Water Supply Act 1947.
2. Planning Strategies should incorporate the management principles outlined in the Water and Rivers Commission's *Acceptability of Land Use Within Public Drinking Water Source Areas* (see Appendix 1) and reflect the Priority 3 classification given to the water reserve.
3. All development proposals within the Water Reserve which are likely to impact on water quality should be referred to the Water and Rivers Commission.
4. Signs should be erected along the boundaries of the Water Reserve to define the reserve and promote public awareness of the need to protect water quality.
5. A process should be put in place to address any spillage of pollutants within the Water Reserve.
6. A surveillance program should be established to identify any incompatible land uses or potential contaminant threats within the Water Reserve.
7. Implementation of these recommendations should be reviewed one year after this plan is endorsed. A full review of this protection plan should be undertaken approximately every five years.



Implementation Strategy

No.	Description	Implemented by	Timing
1	Gazettal of reserve.	<ul style="list-style-type: none"> Program Manager, Protection Planning, Water Quality Protection (WRC) 	1997/98
2	Incorporation into land planning strategies.	<ul style="list-style-type: none"> Shire of Gingin 	On-going
3	Referral of development proposals: <ul style="list-style-type: none"> Provide Shire of Gingin with guidelines for referral of development proposals. Referral of development proposals. 	<ul style="list-style-type: none"> Program Manager, Protection Planning, Water Quality Protection (WRC) Shire of Gingin, Ministry for Planning, Department of Environmental Protection 	1997/98 On-going
4	Erection of signs: <ul style="list-style-type: none"> Development guidelines for signage. Determine location and quantity of signs. Erect signs. 	<ul style="list-style-type: none"> Program Manager, Protection Planning, Water Quality Protection (WRC) Regional Manager, Midwest -Avon Region (WRC) Regional Manager, Midwest-Avon Region (WRC) 	1997/98 1997/98 1998/99
5	Emergency response procedures: <ul style="list-style-type: none"> Develop response plan. Inform WAHMEMS personnel of special requirements for water reserves. 	<ul style="list-style-type: none"> Project Manager, Regional Support Branch (WRC) Project Manager, Regional Support Branch (WRC) 	1997/98 1997/98
6	Surveillance: <ul style="list-style-type: none"> Develop guidelines for surveillance of water reserves. Implement surveillance program. 	<ul style="list-style-type: none"> Program Manager, Protection Planning, Water Quality Protection (WRC) Regional Manager, Midwest-Avon Region (WRC) 	1997/98 On completion of surveillance guidelines
7	Review of this plan and recommendations.	<ul style="list-style-type: none"> Program Manager, Protection Planning, Water Quality Protection (WRC) 	Initial review after 1998/99 Full review after 2002/03



References

Australian Groundwater Consultants, '*Groundwater Scheme Review - Seabird*', Water Authority of Western Australia, Report No. WG 9, September 1988.

Holmes, D. '*Groundwater Protection Plans for the Shires of Dandaragan, Gingin, Moora and Victoria Plains - Goldfields and Agricultural Region*', Water Authority of Western Australia, Report No. WG 203, Draft, June 1995.

Holmes, D. '*Protection of Groundwater Resources Used for Drinking Water Supplies in Country Areas of Western Australia (Country Areas Groundwater Protection Policy)*', Water Authority of Western Australia, Draft, June 1995.

Mappin Marjoram, '*Local Rural Strategy*', Prepared for the Shire of Gingin, February 1995.

Mappin Marjoram, '*Development Strategy and Structure Plan for the Gingin Coastal Region*', Prepared for the Shire of Gingin, June 1992.

Water Authority of Western Australia, '*Gingin Groundwater Area Management Plan*', Report No. WG 160, October 1993.



Appendix 1- Acceptability of Land Uses Within Public Drinking Water Source Areas





WATER AND RIVERS COMMISSION

ACCEPTABILITY OF LAND USES WITHIN PUBLIC DRINKING WATER SOURCE AREAS

OVERVIEW OF PROTECTION FRAMEWORK

The Water and Rivers Commission is responsible for managing and protecting Western Australia's water resources. The Commission has developed policies for the protection of public drinking water source areas which are based on three levels of priority classification.

Priority 1 (P1) source protection areas are defined to ensure that there is no degradation of the water source. P1 areas are declared over land where the provision of the highest quality public drinking water is the prime beneficial land use. P1 areas would typically include land under Crown ownership. P1 areas are managed in accordance with the principle of risk avoidance and so development is generally not permitted.

Priority 2 (P2) source protection areas are defined to ensure that there is no increased risk of pollution to the water source. P2 areas are declared over land where low intensity development (such as rural) already exists. Provision of public water supply is a high priority in these areas. P2 areas are managed in accordance with the principle of risk minimisation and so some development is allowed under specific guidelines.

Priority 3 (P3) source protection areas are defined to minimise the risk of pollution to the water source. P3 areas are declared over land where water supply needs co-exist with other land uses such as residential, commercial and light industrial developments. Protection of P3 areas is achieved through management guidelines rather than restrictions on land use. If the water source does become contaminated, then water may need to be treated or an alternative water source be found.

In addition to priority classification, **wellhead protection zones** and **reservoir protection zones** are defined to protect the water source from contamination in the immediate vicinity of production wells and reservoirs. Wellhead protection zones are usually circular, with a radius of 500 metres in P1 areas and 300 metres in P2 and P3 areas. Reservoir protection zones usually consist of a 2 kilometre area around the top water level of a reservoir and includes the reservoir itself. These zones do not extend outside water reserves. Additional restrictions apply within these zones.

LAND USE COMPATABILITY TABLE

This table is to be used as a guideline only. Further information relating to land use and developments within Public Drinking Water Source Areas including those not listed in the table can be obtained from the Commission.

This table does not replace the need for assessment by the Commission. Please consult the Commission regarding any land use proposals in Public Drinking Water Source Areas which may impact on water resources.



DEFINITIONS USED IN THE TABLE

<i>Compatible</i>	The development/land use is compatible with the management objectives of the priority classification.
<i>Incompatible</i>	The development/land use is incompatible with the management objectives of the priority classification.
<i>Restricted</i>	The development/land use may be compatible with the management objectives of the priority classification with appropriate site management practices. Restricted activities should be referred to the Commission for assessment on a case specific basis.
<i>Extensive</i>	Where limited additional inputs are required to the land to support the desired land use. eg supplementary feed in drought etc.
<i>Intensive</i>	Where regular additional inputs are required to support the desired land use. eg irrigation, additional feed, fertilisers.

AGRICULTURE - ANIMALS

Development	Priority 1	Priority 2	Priority 3
Apiary	Restricted	Restricted	Restricted
Aquaculture eg. marron farm, trout farm etc	Incompatible	Restricted	Restricted
Dairy Farming	Incompatible	Restricted	Restricted
Feedlots	Incompatible	Incompatible	Restricted
Livestock grazing (extensive)	Restricted	Compatible	Compatible
Livestock grazing (intensive)	Incompatible	Incompatible	Compatible
Piggery	Incompatible	Incompatible	Incompatible
Poultry farming (housed)	Incompatible	Restricted	Restricted
Stables	Incompatible	Restricted	Compatible
Stockholding and saleyards	Incompatible	Incompatible ⁷	Restricted ⁷

AGRICULTURE - PLANTS

Development	Priority 1	Priority 2	Priority 3
Broad acre cropping i.e. non-irrigated	Restricted	Compatible	Compatible
Floriculture (extensive)	Incompatible	Restricted	Compatible
Floriculture (intensive)	Incompatible	Incompatible	Restricted
Horticulture	Incompatible	Incompatible	Restricted
Hydroponic Horticulture	Incompatible	Restricted	Restricted
Orcharding	Incompatible	Restricted	Compatible
Potted Nurseries	Incompatible	Restricted	Compatible
Silviculture	Restricted	Restricted	Compatible
Turf Farms	Incompatible	Incompatible	Restricted
Viticulture	Incompatible	Restricted	Compatible



DEVELOPMENT - COMMERCIAL

Development	Priority 1	Priority 2	Priority 3
Aircraft Servicing	Incompatible	Incompatible	Restricted ⁶
Amusement Centre	Incompatible	Incompatible	Compatible ⁶
Automotive business	Incompatible	Incompatible	Restricted ⁶
Boat Servicing	Incompatible	Incompatible	Restricted ⁶
Caravan and trailer hire	Incompatible	Incompatible	Restricted ⁶
Carpark	Incompatible	Incompatible	Compatible
Consulting rooms	Incompatible	Incompatible ⁷	Compatible ⁶
Cottage Industries	Restricted	Incompatible ⁷	Compatible
Drive in take-away food shop	Incompatible	Incompatible	Compatible ⁶
Drive in theatre	Incompatible	Incompatible	Compatible ⁶
Dry Cleaning Premises	Incompatible	Incompatible	Restricted ⁶
Farm supply centre	Incompatible	Incompatible ⁷	Restricted
Fuel depot	Incompatible	Incompatible	Restricted
Garden Centre	Incompatible	Incompatible	Compatible
Local shop	Incompatible	Incompatible ⁷	Compatible
Market	Incompatible	Incompatible	Compatible ⁶
Milk depot	Incompatible	Incompatible	Restricted
Restaurant	Incompatible	Incompatible	Compatible
Service Station	Incompatible	Incompatible	Restricted
Transport Depot	Incompatible	Incompatible	Restricted
Veterinary Clinic/hospital	Incompatible	Incompatible ⁷	Restricted
Wrecking vehicles and machinery	Incompatible	Incompatible	Restricted

DEVELOPMENT - INDUSTRIAL

Development	Priority 1	Priority 2	Priority 3
General Industry	Incompatible	Incompatible	Restricted ⁶
Heavy Industry	Incompatible	Incompatible	Incompatible
Light Industry	Incompatible	Incompatible	Restricted ⁶
Power Stations	Incompatible	Incompatible	Incompatible

DEVELOPMENT - URBAN

Development	Priority 1	Priority 2	Priority 3
Aged and dependent persons accommodation	Incompatible	Incompatible	Compatible ⁶
Amenity building	Incompatible	Restricted	Compatible
Airports or landing grounds	Incompatible	Incompatible	Restricted ⁶
Cemetery	Incompatible	Incompatible	Restricted
Civic building	Incompatible	Restricted	Compatible ⁶
Club	Restricted	Restricted	Compatible ⁶
Community hall	Restricted	Restricted	Compatible
Family Day Care Centre	Incompatible	Restricted	Compatible ⁶
Funeral parlour	Incompatible	Incompatible	Compatible ⁶
Health Centre	Incompatible	Incompatible	Compatible ⁶
Hospital	Incompatible	Incompatible	Restricted ⁶
Medical centre	Incompatible	Incompatible	Compatible ⁶



EDUCATION/RESEARCH

Development	Priority 1	Priority 2	Priority 3
Education Centres	Restricted	Restricted	Compatible ⁶
Primary/Secondary Schools	Incompatible	Incompatible	Compatible ⁶
Scientific Research	Restricted	Restricted	Compatible
Universities	Incompatible	Incompatible	Restricted ⁶

MINING AND MINERAL PROCESSING

Development	Priority 1	Priority 2	Priority 3
Extractive Industries	Restricted ²	Restricted ²	Restricted ²
Mining/Mineral Exploration	Restricted ⁴	Restricted ⁴	Restricted ⁴
Tailings Dams	Incompatible	Incompatible	Restricted

PROCESSING OF ANIMALS/ANIMAL PRODUCTS

Development	Priority 1	Priority 2	Priority 3
Abattoirs	Incompatible	Incompatible	Incompatible
Cheese/butter factory	Incompatible	Incompatible	Restricted
Composting (using sewage sludge and animal products)	Incompatible	Incompatible	Restricted
Fish Processing	Incompatible	Incompatible	Incompatible
Tannery	Incompatible	Incompatible	Incompatible
Woolscourer	Incompatible	Incompatible	Incompatible

PROCESSING OF PLANTS/PLANT PRODUCTS

Development	Priority 1	Priority 2	Priority 3
Breweries	Incompatible	Incompatible	Restricted
Composting (not using sewage sludge or animal products)	Incompatible	Restricted	Restricted
Vegetable/food processing	Incompatible	Incompatible	Restricted
Wineries	Incompatible	Incompatible	Restricted

SUBDIVISION

Subdivision of land to lots of any size is incompatible within Priority 1 areas.

Development	Priority 1	Priority 2	Priority 3
Kennel Subdivisions	Incompatible	Restricted	Restricted
Rural with a minimum lot size of 4 ha (unsewered)	Incompatible	Compatible	Compatible
Rural with a minimum lot size of 1 ha (unsewered)	Incompatible	Incompatible	Compatible
Special rural with a minimum lot size of 2 ha (unsewered) ⁵	Incompatible	Restricted ⁸	Restricted ⁸
Special rural with a minimum lot size of 1 ha (unsewered) ⁵	Incompatible	Incompatible	Restricted ⁸
Urban Residential	Incompatible	Incompatible	Compatible ⁶



SPORT AND RECREATION

Development	Priority 1	Priority 2	Priority 3
Equestrian Centre	Incompatible	Incompatible	Compatible
Golf Courses	Incompatible	Incompatible	Restricted
Irrigated Recreational Parks	Incompatible	Restricted	Restricted
Motor sports i.e permanent racing facilities	Incompatible	Incompatible	Restricted
Public Swimming Pools	Incompatible	Restricted	Restricted
Rifle Ranges	Restricted	Restricted	Compatible
Temporary recreational activities (active) eg four wheel driving, rallies	Incompatible	Restricted ³	Restricted ³
Temporary recreational activities (passive) eg. horse riding, bush walking	Restricted	Restricted	Restricted

STORAGE OF DESIGNATED SUBSTANCES

Development	Priority 1	Priority 2	Priority 3
Above ground storage of designated substances	Restricted ⁷	Restricted ⁷	Restricted ⁷
Bulk Chemical Storage Facility	Incompatible	Incompatible	Incompatible
Underground Storage Tanks	Incompatible	Incompatible	Restricted

TOURISM ACCOMMODATION

Development	Priority 1	Priority 2	Priority 3
Bed and Breakfast	Incompatible	Restricted	Compatible
Caravan Parks	Incompatible	Incompatible	Restricted ⁶
Holiday accommodation eg farm chalets	Incompatible	Restricted ⁹	Compatible ⁶
Motel lodging house, hostels	Incompatible	Incompatible	Compatible ⁶

WASTE TREATMENT AND MANAGEMENT

Development	Priority 1	Priority 2	Priority 3
Deep well injection of effluent	Incompatible	Incompatible	Incompatible
Municipal Landfills	Incompatible	Incompatible	Restricted
Recycling depot	Incompatible	Incompatible	Restricted
Refuse transfer stations	Incompatible	Incompatible	Restricted
Sewers	Incompatible	Restricted	Acceptable
Used Tyre Storage Facility	Incompatible	Incompatible	Incompatible
Wastewater Treatment Plants	Incompatible	Incompatible	Restricted
Water Treatment Plants	Restricted	Restricted	Restricted

OTHER DEVELOPMENTS

Development	Priority 1	Priority 2	Priority 3
Caretakers house	Restricted	Restricted	Compatible
Construction Projects	Restricted	Restricted	Restricted
Forestry	Restricted ¹	Compatible	Compatible
National Parks	Compatible	Compatible	Compatible
Nature Reserves	Compatible	Compatible	Compatible
Radio and TV installation	Restricted	Restricted	Restricted
Major Transport Routes	Incompatible	Restricted ¹⁰	Compatible



-
1. Restrictions apply to fertiliser application rates with strict controls on the application of pesticides and field operations.
 2. Restrictions apply to the storage of fuels and chemicals with strict guidelines for rehabilitation.
 3. Restrictions on the use of fuel and chemicals apply.
 4. Subject to conditions placed on lease.
 5. Special rural development requires appropriate planning justification including provisions in the town planning scheme text.
 6. Must be connected to deep sewerage.
 7. May be permitted if this use is incidental to the overall land use in the area and is consistent with planning strategies.
 8. Restrictions apply to siting effluent disposal systems in areas with poor land capability and a shallow depth to groundwater.
 9. Restrictions apply on density of accommodation.
 10. Restrictions apply on road design and construction and the types of goods that may be carried.

June, 1997

