Department of Environment

Water Resource Protection Series

WRP 53 2005

Margaret River Catchment Area (Including Ten Mile Brook Catchment) Drinking Water Source Protection Plan

MARGARET RIVER CATCHMENT AREA (INCLUDING TEN MILE BROOK CATCHMENT) DRINKING WATER SOURCE PROTECTION PLAN

MARGARET RIVER, PREVELLY, GNARABUP AND COWARAMUP TOWN WATER SUPPLY

Prepared by

Water Resources Division

Department of Environment

DEPARTMENT OF ENVIRONMENT
WATER RESOURCE PROTECTION REPORT SERIES
REPORT NO. WRP 53
MAY, 2005

Acknowledgments

Contribution	Personnel	Title	Organisation
Supervision	S Watson	Program Manager, Protection Planning	Department of Environment
Report Preparation	A Tomlinson	Senior Water Resources Planner	Department of Environment
	R Murton	Senior Asset Management Officer	Water Corporation
	T Bianchini	Scientific Officer	Water Corporation
	S Franz	Water Resource Planner	Department of Environment
	N Welsh	Senior NRM Officer	Department of Environment
Drafting	J McGlenchy	Asset Planning Officer	Water Corporation
Review Committee	M Moir	Community Representative	
	A Darnell	Community Representative	
	R Mountford	Community Representative	
	K Scott	Community Representative	
	B Walsh	Community Representative	
	S Olsen	Community Representative	
	G Voigt		CALM
	W Oldfield		Department of Agriculture

For more information contact:

Department of Environment
Program Manager, Protection Planning
Water Source Protection Branch
3 Plain Street
EAST PERTH WA 6004
Telephone: (08) 9278 0300
Facsimile: (08) 9278 0585

Recommended Reference

The recommended reference for this publication is: Department of Environment, 2005, *Margaret River Catchment Area (including Ten Mile Brook Catchment) Drinking Water Source Protection Plan*, Department of Environment, Government of Western Australia, Water Resource Protection Series Report No. WRP 53.

We welcome your feedback. A publication feedback form can be found at the back of this publication, or online at www.environment.wa.gov.au/public/feedback.

ISBN 0-7309-7544-4
ISSN 1832-1569

Printed on recycled stock.

May, 2005

Cover photograph: *Canebreak Pool – Margaret River* (Sandra Franz)

Foreword

Drinking Water Source Protection Plans

Drinking Water Source Protection Plans establish the level of protection required in catchment areas. Catchment protection of water sources is considered a fundamental part of ensuring the provision of a safe drinking water supply.

Water Source Protection Plans identify sources of contamination that should be investigated and set out programs for management of the resource. The plans are developed in consultation with affected landowners and industry groups and relevant government agencies.

Proclaiming catchment areas under the *Country Areas Water Supply Act 1947* protects the quality of water sources in country Western Australia. The Act's by-laws enable the Department of Environment to control potentially polluting activities, regulate land use, inspect premises and take steps to prevent or clean up pollution.

The Department of Environment aims to work pro-actively 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 Department supports the amendment of Town Planning Schemes and Development Strategies that reflect land uses compatible with Water Source Protection Plans.

This Drinking Water Source Protection Plan provides a basis for establishing compatible land uses in the Ten Mile Brook and Margaret River Catchment Areas and is a mechanism for practical implementation of the Department'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 surface water resource for generations to come.

Water quality protection framework

The Department of Environment is responsible for managing and protecting Western Australia's water resources. The Department has developed policies for the protection of public drinking water source areas that include 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 land 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. Protection of public water supply sources is a high priority in these areas. P2 areas are managed in accordance with the principle of risk minimisation and so some conditional development is allowed.

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 sources need to 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 found.

In addition to priority classifications, reservoir protection zones are defined to protect the water source from contamination in the immediate vicinity of reservoirs. Reservoir protection zones usually consist of a 2 kilometre buffer area around the top water level of a reservoir and include the reservoir itself. These zones do not extend outside the catchment area. Special restrictions apply in these zones.

Contents

Appendices

Figures

Tables

Summary

The Margaret River Catchment Area including the Ten Mile Brook Dam supplies up to 1.0 Gigalitres (GL) of water a year to Margaret River, Prevelly, Gnarabup, and Cowaramup.

The water supplied by the Margaret River Town Water Supply Scheme is of a good quality and meets the National Health and Medical Research Council *Australian Drinking Water Guidelines* (1996).

This plan recognises existing and future land uses within the catchments and outlines a strategy to protect the source while ensuring the continued development of the community.

It is proposed to define all land in the Ten Mile Brook Catchment Area as Priority 1. The Priority 1 classification is assigned to strategic water sources where water supply is the prime beneficial land use.

A proposed Reservoir Protection Zone (subject to by-law amendment) within 2 km upstream of the dam wall will ensure water quality within the dam is maintained.

In the Margaret River Catchment Area, all CALM estate and the stream reserve will be defined as a Priority 1 area to provide the highest level of source protection. All privately owned land in the Margaret River Catchment outside the Ten Mile Brook Catchment will be managed for Priority 3 source protection.

The preparation of this plan has been guided by a review committee including members from the community, catchment groups and relevant government agencies. In preparation of the plan, the Water Corporation and the Department of Environment have received extremely valuable input from the review committee and extend their thanks for their efforts over the review period. The quality of the reviewed plan has been enhanced through their contributions.

1 Introduction

Margaret River is located in the south-western corner of Western Australia, 283 km from Perth (Figure 1). The Margaret River Town Water Supply Scheme provides water to the towns of Margaret River, Prevelly, Gnarabup, and Cowaramup. The water is supplied from the Ten Mile Brook Dam, which is constructed on a tributary of the Margaret River. The Ten Mile Brook Dam is augmented by water from a 'pumpback pool' on the Margaret River when required.

The predominant land use within the two catchments is State forest; within the Margaret River Catchment agricultural activities such as dairy and beef cattle, sheep, horticulture, and viticulture are also present. The catchment is also within a popular tourist and recreation area.

This plan updates the *Margaret River and Ten Mile Brook Catchment Management Plan 1993 – 1998* (Water Authority of Western Australia, 1994) which was prepared in line with an environmental commitment in the Consultative Environmental Review for the new Ten Mile Brook Dam. This plan highlights possible risks to water quality from current land use activities and outlines a strategy to protect the public drinking water source in line with the community's aspirations.

2 Hydrology

2.1 Catchment description

The Margaret River and Ten Mile Brook Catchments are located within the Busselton Drainage Basin which consists of undulating to hilly, low elevation laterite plateau, fringed to the west by the granite outcrops and limestone formations of the Leeuwin-Naturaliste Ridge and to the north by a broad swampy coastal plain (WRC, 1996).

Margaret River collects water from the State forest in the north-western part of the Blackwood Plateau, then drains westward through undulating agricultural areas to the sea, cutting through the Leeuwin-Naturaliste Ridge.

Margaret River has a Mediterranean type climate, with warm dry summers and cool wet winters. The seasonal rainfall results from westerly frontal systems bringing moist air from the ocean. Annual rainfall varies from 1100 mm in the west of the catchment to 900 mm in the east.

The catchment is located within the Shire of Augusta – Margaret River. The rural area of the catchment is part of the Shire's Planning Area No. 6, Margaret River East. The Shire's population in 2001 was approximately 10,266 (RDCWA, 2002).

The area has a long history of agricultural development with a wide range of primary industries operating in the catchment.

2.2 Scheme description

The Margaret River Town Water Supply Scheme has the capacity to supply up to 1.65 GL per year to Margaret River, Prevelly, Gnarabup, and Cowaramup.

The water is supplied from the Ten Mile Brook Dam which is constructed on a tributary of the main Margaret River. The yield of the Ten Mile Brook Catchment is approximately 650 000 kL per year. This varies depending on the annual winter rainfall.

The Ten Mile Brook Dam is augmented by pumping water from Margaret River at the pumpback pool site when flow into the dam from Ten Mile Brook is insufficient to meet scheme demand. There is virtually no detention time once water from the Margaret River enters the Ten Mile Brook Dam. This makes protecting water quality within the Margaret River Catchment more critical given that it is drawn from for a considerable part of the river flow season.

The pumps used to increase storage in the Ten Mile Brook Dam have the capacity to fill the dam in 150 days of continuous pumping. If this were required it would take only 3% of the total annual flow in the Margaret River. Should this occur, the timing of the pumping from the Margaret River will be managed so that only good quality water is pumped into the Ten Mile Brook Dam.

To ensure water users downstream of the dam have sufficient water (both farmers and the environment), the pumps are not operated when flow in the Margaret River is less than double the pumping rate. In normal years this enables pumping to the Ten Mile Brook Dam until November.

The current licensed allocation for town water supplies from the Margaret River – Ten Mile Brook source is 1 000 000 kL (1 GL) per year.

The water supplied by the Margaret River Town Water Supply Scheme is of a good quality. It meets all Natural Resource Management Ministerial Council's (NRMMC) Guidelines for drinking water supplies. The only treatment the water receives is chlorination as a precaution against microbes. Chlorination is the final essential barrier used to ensure good quality public drinking water (NHMRC and ARMCANZ, 1996). Under low turbidity water conditions, chlorination generally removes microbiological contamination from raw water.

2.3 Water quality

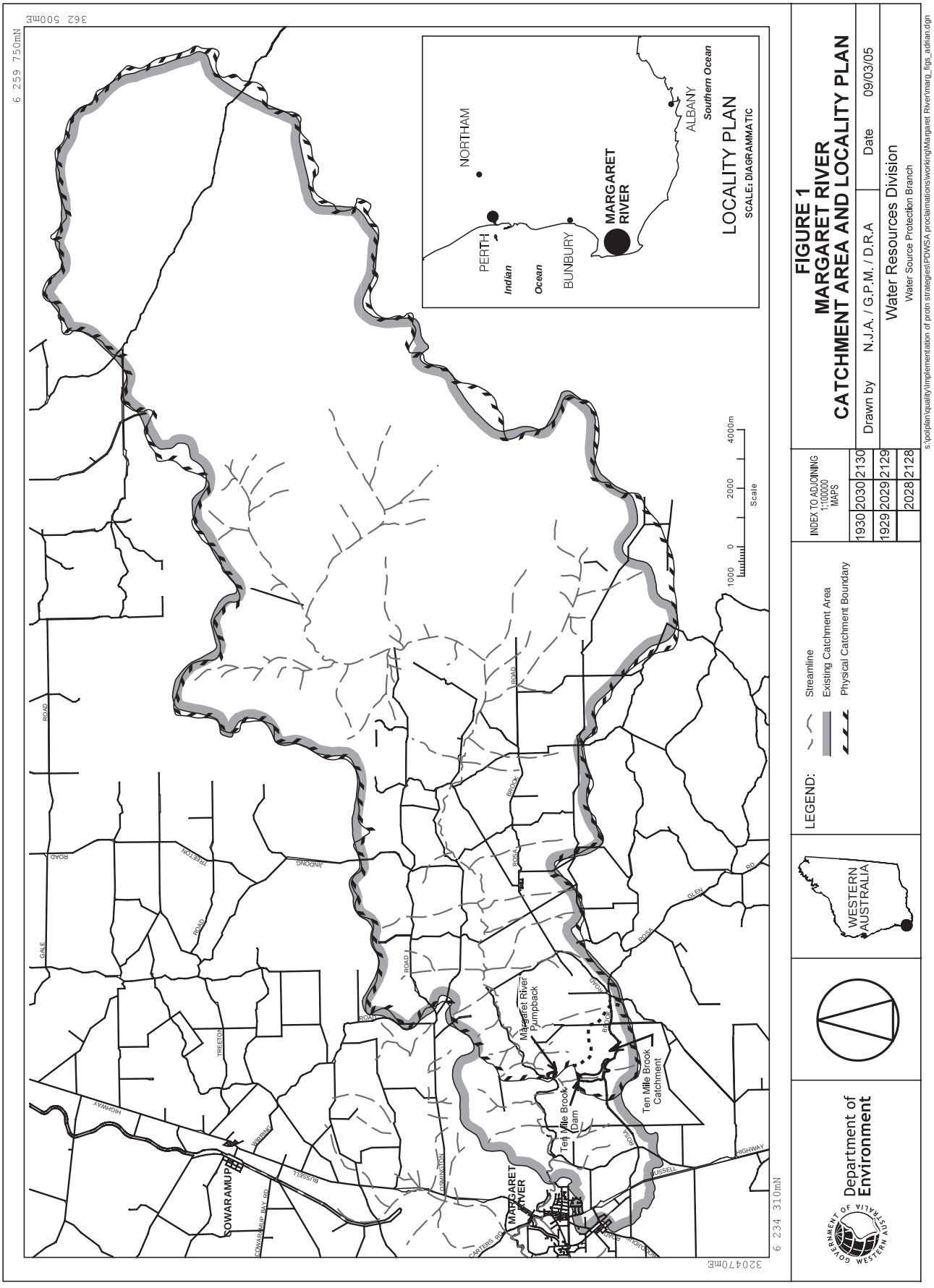
Over the past 5 years microbes have been detected several times in the raw water of Margaret River. These detections indicate faecal matter may have reached the water body.

Generally Margaret River raw water complies with the aesthetic drinking water guideline values apart from the occasional fluctuation of iron and aluminium that is thought to be due to natural variation.

It should be recognised that although reservoir storage and disinfection by chlorination generally removes this contamination, treatment processes alone cannot be relied upon. Where possible, contamination can and should be prevented or reduced through appropriate land use or activity controls in the catchment area. This approach is endorsed by the *Australian Drinking Water Guidelines* (NHMRC & ARMCANZ, 1996) and reflects a 'catchment to consumer' multiple barrier approach for the provision of safe drinking water to consumers.

Appendix 1 shows indicative values of water quality parameters for water from the Ten Mile Brook Dam.

Figure 1: Margaret River Catchment Area and locality plan



3 Ten Mile Brook Catchment Area

3.1 Land uses within the catchment area

All land within the Ten Mile Brook Catchment Area (Bramley Forest Block) is Crown land managed by the Department of Conservation and Land Management (CALM) and the Department of Environment. There is currently no logging activity being undertaken in the catchment. The Bramley Forest Block is designated as State forest and its management is guided by CALM's *Central Forest Region Regional Management Plan*.

Western Power manages the easement for the powerlines and the Shire of Augusta-Margaret River are responsible for Rosa Brook Road.

Generally, recreation activities in Ten Mile Brook Catchment are restricted to an area downstream of the dam wall with only bushwalking permitted in the catchment. No activities are permitted on the water body. Recreation adjacent to the Ten Mile Brook Dam and its catchment is defined in the *Ten Mile Brook Dam Recreation Plan* prepared by CALM (CALM, 1993).

3.2 Potential contamination threats

3.2.1 CALM managed estate

Uncontrolled public access for activities such as firewood collection, marroning and recreation near and on the shores of the water body may result in the contamination of dam water from rubbish and effluent disposal and other risks associated with additional people in the catchment.

3.2.2 Easements

Maintenance of the powerlines easements in State forest traversing the catchment may present threats to water quality from pesticide use to protect poles, herbicides to control vegetation under the lines, and heavy vehicle use along Western Power's maintenance track. Western Power has procedures for these activities including the application of pesticides and herbicides in water catchment areas contained within its *Environmental Policy for Wet Areas* (Western Power, 2004). CALM in collaboration with other government agencies can prescribe further management practices to protect catchment values.

3.2.3 Rosa Brook Road

Rosa Brook Road passes through the top of the Ten Mile Brook Catchment. It is a major regional road and carries significant traffic, especially since the upgrade to Sue's Road. Although the likelihood is low, the potential for contamination from a major chemical/fuel spill, should an accident occur, is real. The short distance down the catchment to the water body gives very little response time to prevent contamination of the Margaret River Town Water Supply.

3.3 Proposed protection area

It is proposed to define all land in the Ten Mile Brook Catchment as Priority 1.

The Priority 1 classification is assigned to strategic water sources where water supply is the prime beneficial land use. Priority 1 areas are managed in accordance with the principle of avoiding any risk of contamination. This approach is necessary to provide the greatest protection to the water quality as the water runs directly to the Ten Mile Brook Dam and cannot be taken selectively as is the case from Margaret River.

Any land in the Ten Mile Brook Catchment within 2 km of the water body upstream of the dam wall should be managed as a reservoir protection zone. This will effectively quarantine the catchment from inappropriate activities.

Recreation activities such as bushwalking and picnicking should be confined to the established downstream facilities that are outside the Priority 1 area.

4 Margaret River Catchment Area

4.1 Land uses within the catchment area

4.1.1 Private land and water use

Approximately one third of the Margaret River Catchment is under private ownership (Figure 2). 30 private licences have been issued to date to extract water directly from the Margaret River. These licences supply water to a variety of land uses.

All issues relating to the taking and use of water for self supply from any lands contiguous to the Margaret River stream reserve shall be referred for decision of granting legal access to the agency responsible for the Rights and Water Irrigation 1914 Act at the time. This agency is currently the Water and Rivers Commission (proposed Department of Environment).

4.1.1.1 Dairying and grazing

The Group Settlement Scheme, which commenced in the 1920s, led to a major expansion of agriculture, which was mainly dairying. By the 1970s the relative importance of dairying had declined with greater numbers of beef cattle and sheep being grazed. Small numbers of goats, horses, and deer are also grazed in the catchment, indicating a further diversification of the grazing industry.

4.1.1.2 Horticulture and viticulture

The area is important for the production of high quality seed potatoes. This mainly occurs in the limited areas of suitable alluvial soils along the main valley and its tributaries. There are also smaller areas used for growing other vegetable crops in the catchment.

Since the first commercial vineyard was planted in the area in 1967, there has been a rapid increase in the area planted with vines. The vines are grown for both table and wine grapes. The suitable alluvial soils and availability of water for irrigation required for the vines restricts this activity to mainly along the main stream and significant tributaries. The climate and soils combine to produce extremely high quality produce.

New wineries are likely to be established in the catchment as a consequence of the increasing area of vines. Recently, olive groves have also been established.

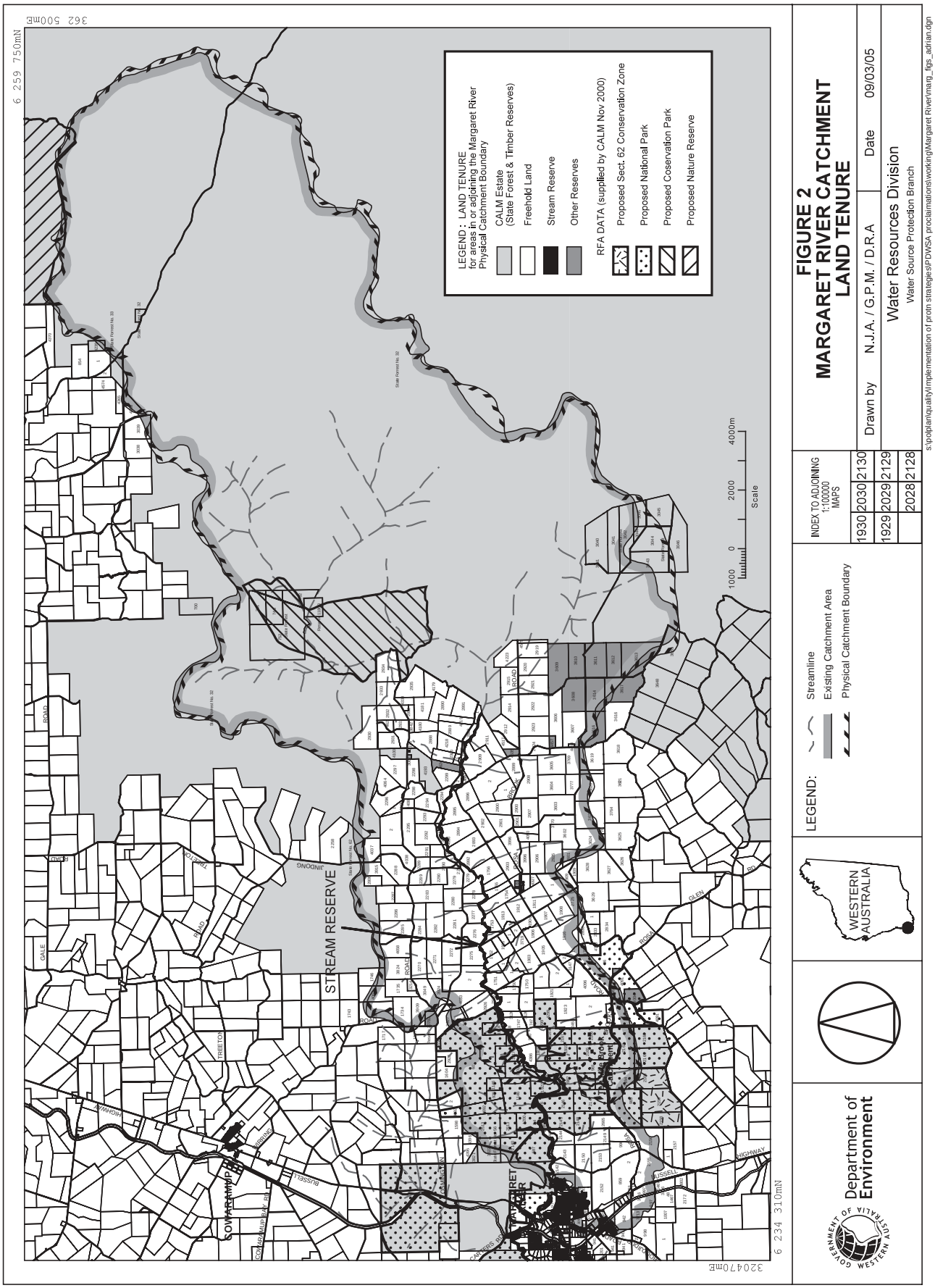
4.1.1.3 Tourism

The diversity of land uses and the attraction of wineries associated with the vineyards, along with the generally highly amenable landscape has given rise to an increase in the tourism activities in the catchment. This has resulted in an increase in farm stays and bed and breakfast accommodation within the catchment.

4.1.1.4 Plantation production

The area of pulp wood plantations of Tasmanian Blue Gums on private land in the catchment is increasing. Plantations provide a significant source of income and are expected to expand, particularly on land with low pasture capability.

Figure 2: Margaret River Catchment land tenure



4.1.1.5 Rural lifestyle activity

The attractive nature of the area and its lifestyle has seen an increase in residents who locate for lifestyle values and farm as a hobby.

4.1.1.6 Rosa Brook townsite

The Rosa Brook hamlet is established in the catchment south of the river. It includes a shop/service station and a community hall. The Shire of Augusta-Margaret River's Town Planning Scheme identifies Rosa Brook as an area for future population growth.

4.1.1.7 Extractive Industries

The only significant current extractive industry in the catchment is a gravel pit. Some exploration for other minerals is being undertaken which may eventually result in further extractive industries being developed. Reserves of coal and gas have been identified and some areas are covered by mining leases.

4.1.2 Crown land

4.1.2.1 CALM estate

About two thirds of the catchment area is Crown land managed by CALM. This includes extensive areas of State forest, recreational facilities and conservation park reserves. Timber production covers both hardwood (sawn logs, Western Power poles, rails and fence posts, commercial and domestic firewood) and softwood (pines). The Forest Products Commission (FPC) plants an average of 1500 ha of pines each year in the region.

An overnight campsite is established at Canebreak Pool. The campsite is heavily used in summer and actively managed by CALM.

CALM is also responsible for maintaining roads and tracks passing through State forest. This excludes major roads, e.g. Rosa Brook Road, that are managed by the Shire.

4.1.2.2 Margaret River stream reserve

There is an existing stream reserve along Margaret River that is currently being vested in the Department of Environment. Its width varies along its length and it extends from upstream of the Ten Mile Brook Dam and along the Margaret River into the State forest.

Well-vegetated stream reserves can provide a buffer between the river and its catchment and can act as a filter to control pesticides, herbicides, and fertilisers from entering the stream. They also reduce sediment disturbance and may provide protection for native wildlife within and adjacent to the stream. Reserves can also provide more attractive scenery and opportunities for recreation.

The effectiveness of the stream reserve varies along the river due to variations in the standard of fencing, vegetation, floodways, stock access, land use on adjoining properties, and weed and rabbit infestation.

The Water Corporation will have the responsibility for fencing, weeding and revegetation of the stream reserve once the land is vested in the Department. Existing and future licensed water users will continue to have access to the Margaret River through the stream reserve.

4.1.2.3 Shire road reserves

The Shire is responsible for maintaining roads in the developed part of the catchment. The road that has the most use is Rosa Brook Road, which also passes through the Ten Mile Brook Catchment.

4.1.3 Recreation

Recreation activities in the catchment are largely associated with Margaret River and its environs.

The camping site at Canebreak Pool offers ready access to the river and water based activities such as swimming and canoeing. These activities are carried out along the river wherever suitable pools or stretches of water are found. Marroning is not allowed between Canebreak Pool and Ten Mile Brook Dam, this regulation is enforced by the Department of Fisheries.

Land based recreation such as bushwalking and four wheel driving occurs throughout the forested areas of the catchment.

4.1.4 Heritage

A native title claim over the Margaret River Catchment Area has been lodged by the South West Boojarah Group. Rights granted under native title may have minor implications for protection of water quality.

Three sites of significance have been identified including the Margaret River, the Margaret River Dam site and Rosa Brook Road.

4.2 Land use planning

The Shire of Augusta - Margaret River's Town Planning Scheme No. 11 applies to the catchment.

The Planning Unit No. 6 - Margaret River East provides the detailed land use planning provisions affecting catchment management. The Scheme's principal objective is 'to maintain the area's viability as an important grazing area and ensure that intensive agricultural pursuits within the area are monitored to ensure that there is no detrimental effect on water quality'. This objective complements the aims of this plan. Under the TPS, decisions on land use planning are the Shire's responsibility. The conditions on land use in the planning unit document are not specific to land within the Margaret River Catchment Area, except that marginal decisions on acceptable developments will be influenced by the need to protect water quality in the river.

The Town Planning Scheme is subject to review. It provides the most effective mechanism for achieving water source protection objectives. The Shire has indicated its support for establishing complementary source protection and land use planning approaches. This is consistent with the West Australian Planning Commission's Statement of Planning Policy 2.7 for Public Drinking Water Source Areas.

4.3 Margaret River Action Plan

The review committee indicated that much of the Margaret River community regard conservation issues as particularly important. Water source protection is often complementary to conservation objectives with a focus on minimising and managing impacts on water. The blending of conservation philosophies into agricultural activities is a model to be pursued in the Margaret River community.

The Margaret River Action Plan was developed and released in 2003 by Cape to Cape Catchment Group, Department of Environment and GeoCatch. The plan identified several issues for management of the Margaret River and surrounding areas, and updated the information and guidance given in the Margaret River and Ten Mile Brook Catchment Management Plan.

Management of the stream reserve will occur in consultation with the Cape to Cape Catchment Group and under the guidance of the Margaret River Action Plan.

4.4 Potential contamination threats

4.4.1 Private land

Rural land uses can impact on catchment water quality if they are not properly managed.

Many farming operations involve the use of pesticides, storage of fuel, and mechanical servicing. Many rural properties contain tributaries to Margaret River, which provide rapid conduits for contaminants moving to the river if vegetation along streamlines is not maintained.

The Department of Environment prepares Water Quality Protection Notes outlining best management practices for a range of activities that could affect water quality.

Water quality considerations for land use activities in the Margaret River Catchment are discussed below.

4.4.1.1 Dairying and grazing

Intensive grazing of stock on or near watercourses has the potential to increase the runoff of nutrients, chemicals, bacteria, and turbidity. Maintaining streamline vegetation which acts as a filter to remove contaminants, and fencing streams, will prevent direct stock access. Dairy waste runoff, which is rich in nutrients, bacteria and microbes, can be a significant source of contamination of watercourses and increases the risk of *Cryptosporidium* and *Giardia* entering water supplies.

The Department of Agriculture in conjunction with the Department of Environment and the Dairy Industry of Western Australia have produced the *Environmental Management Guidelines for Animal-based Industries – Dairy Farm Effluent* (1988). The guidelines provide best environmental practices for the management of dairy farm waste.

4.4.1.2 Horticulture and viticulture

Fertilisers and pesticides applied to horticultural activities have the potential to leak into the environment and enter waterways. Disturbance of soil during cropping activities can cause increased erosion, providing a direct pathway for contaminants to move to watercourses and increasing turbidity.

Clearing of native vegetation, particularly along streamlines, will reduce the capture of contaminants and therefore could adversely affect the water quality.

Wineries require effective design measures to ensure waste products are correctly managed and not allowed to pass into waterways.

Several guidelines have been developed to assist industries in ensuring their management practices minimise impacts to the environment. Guidelines which may assist agriculturalists in this area include: Environmental Management Guidelines for Vineyards (WRC et al., 2002), Water Quality Protection Note: *Wineries* (DoE, 2002) and the *Code of Practice for Environmentally Sustainable Vegetable and Potato Production in Western Australia* (Potato Growers Assoc. of WA, 2002).

4.4.1.3 Tourism

Improper siting of tourism amenities and waste disposal (rubbish and septage) near watercourses will lead to an increased contamination risk. These activities need to be managed to ensure adequate buffers are maintained. The DoE has produced the Water Quality Protection Note *Buffers to sensitive water resources* (Draft, 2005) which provides guidance on establishing, maintaining and protecting vegetated buffers between land use activities and sensitive water bodies managed to protect their value to the community.

4.4.1.4 Agroforestry

Potential risks to water quality from agroforestry are increased turbidity and the use of fertilisers and herbicides, especially at establishment and harvesting.

4.4.1.5 Lifestyle residents

Increasing population densities associated with small lot subdivision for rural lifestyle activities and tourism can pose risks to water quality from effluent disposal and additional 'people pressures' in the catchment.

Water quality risks associated with rural lifestyle activities can be effectively managed through Town Planning Scheme provisions. These can prescribe appropriate land uses and reinforce good land management practices.

4.4.1.6 Rosa Brook townsite

Rosa Brook townsite's small population is not a major threat to the water quality of Margaret River. However, if substantial growth occurs, impacts on water quality will need to be considered. Considerations such as wastewater disposal, land capability assessment and adoption of water sensitive urban design principles will need to be addressed in proposals to expand the town.

The shop has an underground fuel tank that has significant potential to leak and pollute groundwater if not properly maintained.

4.4.1.7 Extractive industries

Extractive industries can impact on water quality through the mobilisation of soil (turbidity) during mining and earthmoving activities and on a continuing basis if sites are not properly rehabilitated.

Turbidity risks are particularly significant in wet conditions when there is a potential of increased erosion taking place.

Also the servicing of earthmoving equipment and the operation of drilling rigs may introduce pollutants such as oils and grease. The Department of Environment and CALM have prepared policies and information notes on extractive industries and mechanical servicing (see references).

4.4.2 Crown land

4.4.2.1 Landfill sites

Approximately 22 landfill sites have been closed within the Margaret River Catchment Area. These sites are regarded as a high risk to drinking water quality due to the potential for leachate to form and seep into the watercourse.

4.4.2.2 CALM managed estate

About two thirds of the catchment area is vested in the Conservation Commission and managed by the Department of CALM. This includes an extensive area of State forest, some conservation park, Mowen Nature Reserve and a number of developed recreation sites. CALM is currently undertaking a management planning process for the proposed Bramley State Forest to be incorporated into a new national park.

The forest contains a network of roads and tracks and is periodically subject to prescribed burning to protect forest and properties from wildfire.

Conservation reserves in the area are managed for nature conservation and recreation. State forest is managed for multiple use for timber production, flora and fauna conservation, recreation and catchment protection. In addition to timber harvesting carried out by contractors operating under codes of practice set by CALM, there is also a considerable amount of domestic firewood cutting.

The majority of the Margaret River Catchment Crown land is to be gazetted as the Margaret River National Park in accordance with the *Regional Forest Agreement for the South West Region of Western Australia* (1999). This land is already managed as a national park.

Recreation in the CALM estate in the Margaret River Catchment mainly takes place at locations where access to river pools is available, such as Canebreak Pool where there is an overnight campsite near the pool that has significant use in summer. There are other less developed recreation sites elsewhere in the catchment.

Camping requires appropriate site management, including site design and maintenance controls on waste disposal, and guidance on conducting recreation activities safely and with minimal impact to the environment. Management measures are in place to help protect the water source in the CALM estate.

The Crown land also contains pine plantations managed by FPC, similar to the agroforestry on private land with similar water resources management considerations.

Tracks within the CALM estate can also be a source of turbidity during rainfall events.

4.4.2.3 Margaret River stream reserve

The stream reserve acts as a buffer to protect the river from the entry of contaminants. The effectiveness of this barrier is reduced by weeds and pests having a detrimental effect on native vegetation, entry of stock (particularly cattle) entering the reserve through the lack of fences and destroying banks and vegetation; and unrestricted access for marroning and other recreational activities. Future management of the stream reserve will be guided by the Margaret River Action Plan and in consultation with the Cape to Cape Catchment Group.

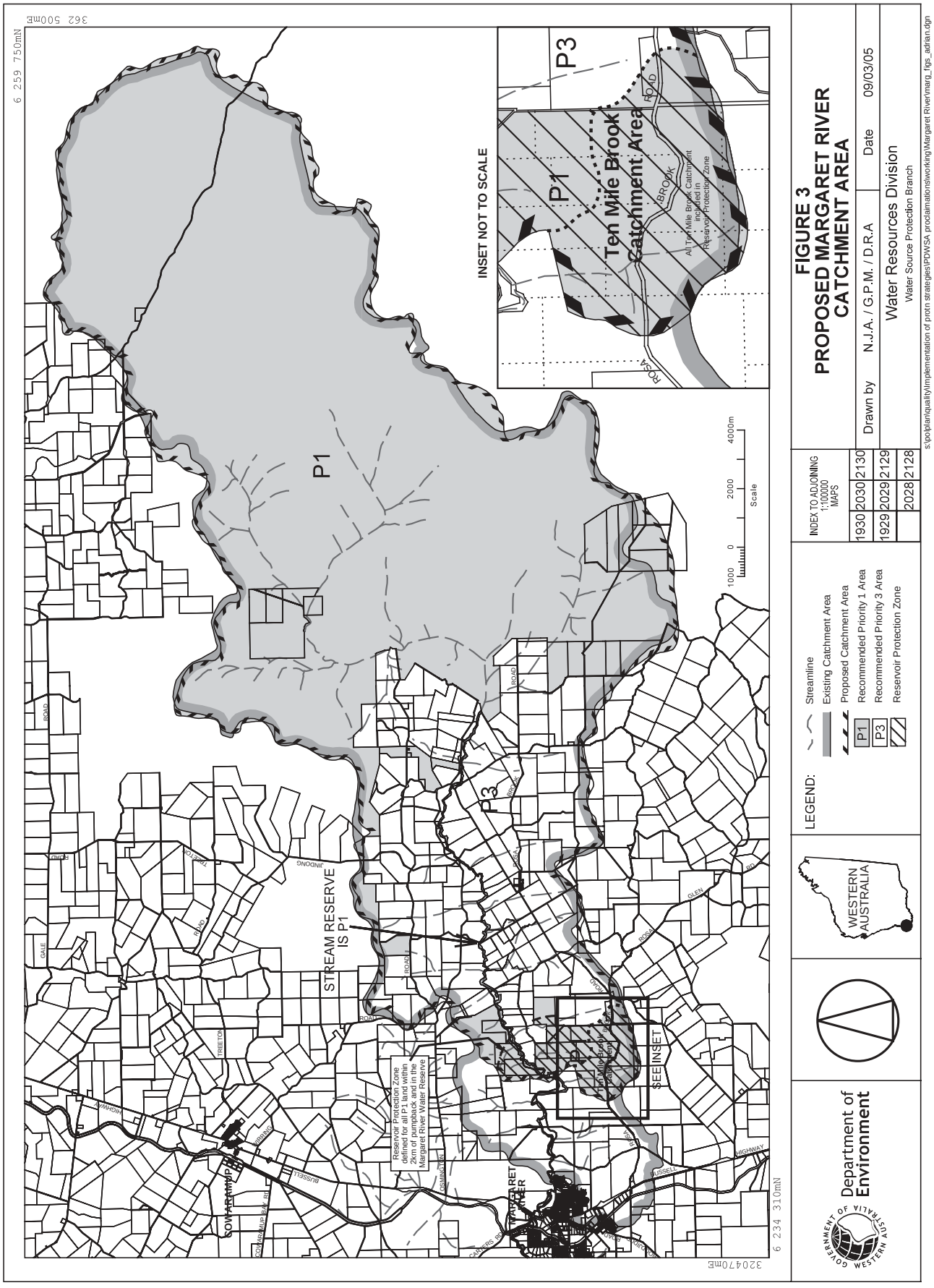
4.4.2.4 Shire road reserves

Many of the roads on the Margaret River Catchment are unsealed and therefore could be a substantial contributor to turbidity in the river during rainfall events. There is potential on any road for the spillage of chemicals and fuel resulting from traffic accidents. This is particularly significant where roads cross watercourses as pollutants can move quickly to the river system before they can be contained.

4.5 Proposed protection area

The proposed priority classifications for the Ten Mile Brook and Margaret River Catchment Areas are shown in Figure 3.

Figure 3: Proposed Margaret River Catchment Area



4.5.1 Priority 1 areas

The CALM estate and the stream reserve in the Margaret River Catchment is proposed for a Priority 1 classification to provide the highest level of source protection. This area includes the land surrounding the pumpback pool, and CALM estate in the eastern reaches of the catchment. This classification is appropriate because the land is in public ownership and land uses are compatible with Priority 1 source protection. Furthermore, the part of the catchment surrounding the pumpback pool has potential to immediately impact on water.

The stream reserve provides an important barrier for the movement of contaminants from the catchment to the waterway and therefore will be classified P1. The high level of protection of the State forest in the upper reaches the catchment will protect future water supply options for the Margaret River Town Water Supply.

4.5.2 Private land

It is proposed that all privately owned land in the Margaret River Catchment will be managed for Priority 3 source protection. This classification is appropriate, as it recognises existing land uses and allows water supply values to co-exist with other land uses.

The Priority 3 classification will enable the continuation of existing land uses and encourage landowners to use best management practices to limit potential impacts on the water resource.

A Water Quality Protection Note on *Land Use Compatibility in Public Drinking Water Source Areas* is attached as Appendix 3 for reference.

5 Risk assessment

The Water Corporation have prepared a risk assessment as part of a sanitation survey. Table 1 is an extract from the survey which outlines the activities within the catchment and their relative hazard, catchment management priority and current catchment preventative strategies.

Table 1 Margaret River Catchment Area risk assessment

Land use/ Activity	Hazard event/Source	Hazard[1]	Catchment management priority[2]	Considerations	Current catchment preventive and management strategies
State Forest					
Fire management – control burns, wildfire	Erosion and ash following fires	Turbidity	Medium	CALM is responsible for fire management within the catchment	Water quality monitoring
Firewood collection	Human activity	Pathogens Turbidity	Medium Low	Access is easy throughout forested parts of the catchment	Surveillance, signage
Roads – sealed and unsealed	Fuel and chemical spills	Hydrocarbons and chemicals	Medium		CALM and FPC management of State forest roads
	Erosion	Turbidity	Medium		CALM and FPC management of State forest roads
Disused landfill/ waste transfer station	Groundwater leaching	Hydrocarbons and chemicals	Medium	Due to the nature of the landfill sites, risk levels and contaminants are fairly unknown	
Timber production	Fuel and chemical spills	Hydrocarbons and chemicals	Medium	Agroforestry in close proximity to stream	Water quality monitoring
	Erosion	Turbidity	Medium	Agroforestry in close proximity to stream	Water quality monitoring
Recreation					
Fishing and marroning	Human activity and use of baits	Pathogens	High	Access is easy throughout forested parts of the catchment, updated signage is required	Water quality monitoring, surveillance, signage
Swimming	Human activity	Pathogens	Medium	Access is easy through the catchment. Swimming thought to occur in moderate amounts at Canebreak Pool. This is on the outskirts of the catchment approximately 17 km from the offtake. Low amounts of swimming in periods of water offtake	Water quality monitoring
Camping	Human activity	Pathogens	High	Surveillance of low consequence as camping is permitted in established campgrounds within the catchment	Water quality monitoring
Rural Land					
Agriculture	Stocking of land	Pathogens	High	Agriculture in close proximity to streamlines	Water quality monitoring, fencing, revesting of Margaret River stream reserve, buffering
	Fertiliser use/effluent Chemical spraying	Nutrients Chemicals/ pesticides	Medium Medium	Agriculture in close proximity to streamlines	Water quality monitoring
Dairies (4)	Stocking of land	Pathogens	High	Agriculture in close proximity to streamlines	Water quality monitoring, fencing, revesting of Margaret River stream reserve
Horticulture	Fertiliser use Chemical spraying	Nutrients Hydrocarbons and chemicals	Medium Medium	Agriculture in close proximity to streamlines	Water quality monitoring
Viticulture	Chemical/pesticide spraying	Chemicals/ pesticides	Medium	Viticulture in close proximity to streamlines	Water quality monitoring, PSC88, revesting of Margaret River stream reserve
Residential development	Septics	Pathogens	Medium	Low density development	Water quality monitoring

[1] See Table 2 Water quality hazards and the potential impact on consumers. [2] Catchment management priority scale used: *High*, *Medium* and *Low*.

Table 2 Water quality hazards and the potential impact on consumers

Hazard	Potential Impact on Consumer
Health	
Hydrocarbons (e.g. fuels, oils and solvents) and Organic Chemicals	Some toxic and some carcinogenic. Harmful by-products may be formed when combined with chlorine. May have poor taste and smell.
Nutrients	Nitrate/nitrite is toxic to humans at high levels, with infants less than three months old being most susceptible. Nutrients can cause algal blooms.
Pathogens (Bacteria, Viruses, Protozoa)	Disease-causing organisms.
Pesticides	Are toxic and some potentially carcinogenic.
Aesthetic	
Colour	Not a health consideration if derived from natural organics. Harmful by-products may be formed when combined with chlorine.
Total Dissolved Solids / Salinity	Poor taste and corrosion to pipe work and household appliances.
Turbidity	Discolouration and cloudiness of water. May reduce the effectiveness of disinfection.

Refer to the ADWG for further information about water quality hazards, available via www.health.gov.au/nhmrc/publications.

6 General strategies for source protection

6.1 Conservation

Landholders should be provided with information on the benefits from and opportunities to conserve native vegetation to promote wildlife corridors. Subsidies are available through the Water Corporation and the Cape to Cape Catchment Group for fencing and works which will improve the water quality to the Margaret River.

A stream reserve fencing subsidy is available to assist landowners in managing and protecting the stream reserve and main tributaries.

Opportunities for additional sources of funding to support the fencing of remnant vegetation to exclude stock and therefore damage to the stream reserve should be investigated by those wishing to fence areas on private property; additional information can be sought from the Cape to Cape Catchment Group.

Opportunities for conservation of native vegetation, and the rehabilitation of sensitive areas should be pursued when considering subdivision and development applications.

6.2 Recreation

The recreational activities in the Margaret River and Ten Mile Brook Catchment Areas generally follow the guidelines set by the Water and Rivers Commission's Statewide Policy No.13, *Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land* (WRC, 2003). The compatibility of specific land and water based recreational and other transient activities in P1 areas is defined in Tables 1 and 2. In general only passive recreation, such as bushwalking, will be allowed in the Ten Mile Brook Catchment Area. All water based activities are prohibited in the Ten Mile Brook and the intake pool on the Margaret River. Swimming in Margaret River in the State forest area is generally incompatible with water source protection objectives, but will be allowed at existing designated sites such as Canebreak Pool.

6.3 Land use planning

Town Planning Schemes provide the most accessible reference for landowners on land development requirements and land use decisions that can have a fundamental impact on water quality. Therefore, the recommended priority protection strategy, which has been developed with consideration for water source protection requirements and land use values, should be recognised in the Town Planning Scheme.

The Shire of Augusta-Margaret River has indicated its support for establishing complementary planning provisions in the catchment area in accordance with *Statement of Planning Policy 2.7*.

The Department of Environment can advise on appropriate scheme provisions to establish consistency between town planning and water resources legislation.

6.4 Surveillance and by-law enforcement

The quality of public drinking water sources within country areas of the State is protected within Public Drinking Water Source Areas (PDWSAs) proclaimed under the *Country Areas Water Supply Act 1947*. Declaration of these areas allows use of by-laws to protect water quality.

The Department considers by-law enforcement, through on-ground surveillance of land use activities in catchment areas and water reserves, as an important water quality protection mechanism.

Surveillance is also important in raising the general level of awareness of the need to protect water quality.

Signs are erected in PDWSAs to advise of the location, activities that are prohibited or regulated and water quality protection measures.

7 Strategies for source protection in the Ten Mile Brook Catchment Area

7.1 CALM managed estate

Crown land surrounding Ten Mile Brook Dam provides a high level of security to the water source. Educative signs should be installed to inform the public of acceptable activities in the catchment and how they can play a role in managing water quality.

The possibility of installing gates on access tracks into the catchment to discourage vehicle usage in the catchment should be considered.

No logging is occurring in the Ten Mile Brook Catchment. As with all Priority 1 catchments, all forestry should avoid risks to the water source through adherence to CALM codes of practice for forest operations.

Water quality protection approaches include requirements for road maintenance, fuel storage and handling, restrictions on pesticide use, maintenance of buffer zones along watercourses and recognition of the reservoir protection zone.

The Department of Environment will work with CALM and the FPC to ensure the *Contractors' Timber Harvesting Manual* (2003) and *Code of Practice for Timber Plantations in WA (1999)* outline appropriate protection measures for forestry in public drinking water source areas.

7.2 Powerlines

To minimise water quality impacts from maintenance of powerline easements, Western Power has adopted a wet areas policy which undertakes to:

- Use the minimum amount of chemicals necessary and only those on the approved list for use in water supply catchments;
- Whenever possible undertake maintenance activities in the catchment in dry soil conditions, to minimise turbid runoff; and
- Upgrade and maintain access tracks to include runoff control to minimise turbid runoff.

7.3 Rosa Brook Road

To manage contamination risks associated with stormwater runoff and emergency response along Rosa Brook Road, the following measures should be adopted:

- Introduction of design measures to manage stormwater and contain spills or direct contaminants away from drainage lines flowing into Ten Mile Brook;
- Development of an emergency plan with the Shire, Police, SES, Department of Environment, and Water Corporation to manage fuel and chemical spills; and
- Investigation of approaches to discourage transport of dangerous goods along Rosa Brook Road.

7.4 Protection zone

Specific protection zones are defined to protect drinking water sources from contamination in the immediate vicinity of water extraction facilities. Within these zones by-laws may prohibit, restrict or approve defined land uses and activities to prevent water source contamination or pollution. Special conditions, such as restrictions on storage and use of chemicals, may apply within these zones. The legislation is currently being reviewed to simplify and enhance the protection of public drinking water sources.

Reservoir protection zones (or 'prohibited zones' as they are called in the by-laws) consist of a statutory 2 kilometre wide buffer area around the top water level of storage reservoirs in the Perth water supply area, and include the reservoir waterbody. The reservoir protection zones (RPZ) apply over Crown land and prohibit public access to prevent contamination (physical, chemical and biological) of the source water. RPZ do not extend outside PDWSA boundaries. The DoE is currently considering a provision for RPZ buffer areas of less than 2 kilometres, and creation of consistent by-laws for country and Perth PDWSAs.

8 Strategies for source protection in the Margaret River Catchment Area

8.1 Dairying and grazing

Establishment and maintenance of vegetated buffers along streamlines provides a critical barrier to contaminants moving to the watercourse. The DoE's Water Quality Protection Note *Buffers to sensitive water resources* (Draft, 2005) provides guidance on establishing, maintaining and protecting vegetated buffers between land use activities and sensitive water bodies managed to protect their value to the community.

Landowners should be encouraged to keep stock out of watercourses through the stream reserve fencing subsidy (which includes provision for establishing off-stream watering facilities). Wherever possible streamlines should be retained or reinstated to provide filters for runoff into watercourses.

The Department of Environment can provide information to landowners on approaches to protect streamlines.

Dairy farmers should be encouraged to establish dairy waste containment re-use measures to prevent runoff into watercourses and adopt best management practices as outlined in *Environmental Management for Animal Based Industries – Dairy Farm Effluent* (AGWA Bulletin 4336).

8.2 Horticulture and viticulture

Landowners should be encouraged to:

- Maintain sufficient buffer zones between cultivated areas and streamlines;
- Adopt cultivation techniques which reduce soil disturbance and therefore erosion;
- Use fertilisers and chemicals in a manner which minimises drift and wastage to watercourses; and
- Adopt industry codes of practice.

8.3 Tourism

Town Planning Scheme provisions should ensure all new developments include appropriate waste management systems, provide adequate separation distances to streamlines, and are consistent with the recommended priority source protection classifications.

8.4 Lifestyle residents

Town Planning Scheme provisions should ensure land activities are consistent with Priority 3 source protection objectives for any proposed 'rural lifestyle' special rural zones.

Catchment and Shire rangers should provide information to residents on how to improve their property management techniques and minimise impacts on water quality.

8.5 Rosa Brook townsite

Town Planning Scheme provisions should ensure all developments at the Rosa Brook townsite meet Priority 3 source protection criteria including appropriate wastewater management measures.

Any proposals for urban development should include assessment of land capability and manage impacts on water quality through adoption of water sensitive urban design principles and appropriate wastewater management systems.

Fuel storage facilities should be maintained to the standards outlined in the Department of Environment's Water Quality Protection Note - *Underground Chemical Storage Tanks* (DoE, 1999). This may include a requirement for tank integrity testing.

8.6 Extractive industries

Any sand or gravel extraction should be undertaken in accordance with the Department of Environment's Water Quality Protection Note - *Extractive Industries* (DoE, 2000) and CALM's Policy Statement No. 2 *Local Government Authority Access to Basic Raw Materials from State Forest and Timber Reserves* and Policy Statement No. 10 *Rehabilitation of Disturbed Land*.

8.7 Priority 1 areas

The CALM managed estate provides a secure long-term water source for Margaret River. The Water Corporation should install signs to inform the public of restrictions on activities in the catchment.

The Water Corporation and CALM should investigate the possibility of installing gates on tracks into the catchment to discourage vehicle access.

As with all Priority 1 areas, forestry operations should avoid risks to the water source through adherence to CALM codes of practice for forest operations. Water quality protection approaches include requirements for road maintenance, fuel storage and handling, restrictions on pesticide use, and maintenance of buffer zones along watercourses.

The camping area at Canebreak Pool should continue to be managed with the objective of avoiding contamination risks to the Margaret River. Roads should be maintained to minimise turbid runoff into watercourses.

8.8 Margaret River stream reserve

The Water Corporation will continue to maintain the stream reserve by controlling pests and weeds. Residents should continue to be encouraged to exclude stock from watercourses through the fencing subsidy program. Landowners are encouraged to adopt safe storage of fuel for extraction pumps to prevent spillage or leakage into the waterway.

8.9 Shire road reserves

Best management practices should be adopted in road construction and maintenance practices that will minimise stormwater runoff into watercourses.

Margaret River Shire should investigate whether signage and reduced speed limits on roads crossing the Margaret River and substantial feeder streams could reduce the chances of accidents.

An emergency plan will be developed by the Shire, Police Department, the State Emergency Service, the Department of Environment, and the Water Corporation to manage fuel and chemical emergencies.

9 Recommendations

1. The Margaret River Catchment Area including the Ten Mile Brook Catchment should be redefined and gazetted under the *Country Areas Water Supply Act 1947* to follow the most current land contour data, as shown in Figure 3.

2. In the review of their Town Planning Scheme the Shire of Augusta-Margaret River should consider *Statement of Planning Policy 2.7* and incorporate the management principles outlined in this plan and in the Department of Environment's Water Quality Protection Note – *Land Use Compatibility within Public Drinking Water Source Areas* (see Appendix 3), and reflect the priority classifications shown for the catchment areas.

3. All development proposals in the Margaret River Catchment Area which are likely to impact on water quality should be referred to the Department of Environment for advice and recommendations.

4. Surveillance, signage and by-law enforcement responsibilities in the catchment areas should continue to be delegated to the Water Corporation. Signage to be erected along main roads within the catchment with an emergency contact number in the event of a spill.

5. The strategies detailed in Sections 6 and 8 'Strategies for Source Protection' should be adopted.

6. Encourage adoption of industry best management practices for agricultural activities within the catchment and implementation of recommendations from the *Margaret River Action Plan* (Cape to Cape Catchment Group, 2003).

7. Investigate and assess the impact of the decommissioned tip sites on water quality and remediate to appropriate levels.

8. The FPC's *Code of Practice for Timber Harvesting, Timber Plantations, the Contractors' Timber Harvesting Manual*, and associated specifications and plantation management plans should include provisions for water quality protection. Such provisions include, but are not limited to

    - Road maintenance, fuel storage and handling, fertiliser use, pesticide use and buffer zones along watercourses.
    - Regular review of proposed harvesting plans for the catchment.
    - Identification of relevant catchment area boundaries.
    - Review of operating performance of water quality protection measures.

9. DoE to notify the Local Emergency Management Advisory Committee that the Margaret River Catchment is a gazetted public drinking water source area.

10. An implementation strategy to be developed by the DoE's South-West Region to implement these recommendations.

11. Progress in implementing these recommendations should be periodically reviewed. A full review of this protection plan should be undertaken after five years.

10 Glossary

Allocation	The quantity of surface water permitted to be abstracted by a licence, usually specified in kilolitres/year (kL/a)
Augment	To increase the available water within a storage dam by pumping back water from a secondary reservoir/storage dam.
Catchment	The area of land which intercepts rainfall and contributes the collected water to surface water (streams, rivers, wetlands) or groundwater.
Diffuse Source Pollution	Pollution originating from a widespread area, e.g. urban stormwater runoff, agricultural runoff.
Effluent	The liquid, solid or gaseous wastes discharged by a process, treated or untreated.
Leaching / Leachate	The process by which materials such as organic matter and mineral salts are washed out of a layer of soil or dumped material by being dissolved or suspended in percolating rainwater. The material washed out is known as leachate. Leachate can pollute groundwater and waterways.
m AHD	Australian Height Datum. Height in metres above Mean Sea Level +0.026 m at Fremantle.
Nutrient Load	The amount of nutrient reaching the waterway over a given time (usually per year) from its catchment area.
Nutrients	Minerals dissolved in water, particularly inorganic compounds of nitrogen (nitrate and ammonia) and phosphorus (phosphate) which provide nutrition (food) for plant growth. Total nutrient levels include the inorganic forms of an element plus any bound in organic molecules.
Pesticides	Collective name for a variety of insecticides, fungicides, herbicides, algicides, fumigants and rodenticides used to kill organisms.
Point Source Pollution	Pollution originating from a specific localised source, e.g. sewage or effluent discharge, industrial waste discharge.
Pollution	Water pollution occurs when waste products or other substances, e.g. effluent, litter, refuse, sewage or contaminated runoff, change the physical, chemical, biological or thermal properties of the water, adversely affecting water quality, living species and beneficial uses.
Public Drinking Water Source Area	Includes all underground water pollution control areas, catchment areas and water reserves constituted under the *Metropolitan Water Supply Sewerage and Drainage Act 1909* and the *Country Areas Water Supply Act 1947*.
Runoff	Water that flows over the surface from a catchment area, including streams.

Reservoir Protection Zone (RPZ)	a) That part of a catchment area which lies upstream of a reservoir and is within 2 kilometres of the top water level; b) That area adjacent to a reservoir, the extent of which is identified on plans; and c) Includes the reservoir.
Reservoir	A reservoir, dam, tank, pond or lake that forms part of any public water supply works.
Scheme Supply	Water diverted from a source (or sources) by a water authority or private company and supplied via a distribution network to customers for urban, industrial or irrigation use.
Storage Reservoir	A major reservoir of water created in a river valley by building a dam.
Stormwater	Rainwater which has run off the ground surface, roads, paved areas etc. and is usually carried away by drains.
Treatment	Application of techniques such as settlement, filtration and chlorination to render water suitable for specific purposes including drinking and discharge to the environment.
Wastewater	Water that has been used for some purpose and would normally be treated and discarded. Wastewater usually contains significant quantities of pollutant.
Water Quality	The physical, chemical and biological measures of water.

11 References

Cape to Cape Catchment Group, 2003, *Margaret River Action Plan*, Water and Rivers Commission.

Department of Conservation and Land Management (CALM), Statement No. 2 *Local Government Authority Access to Basic Raw Materials from State Forest and Timber Reserves*.

Department of Conservation and Land Management (CALM), Policy Statement No. 10 *Rehabilitation of Disturbed Land*.

Department of Conservation and Land Management (CALM), 1987, *Central Forest Region Regional Management Plan 1987-1997*, CALM, Perth.

Department of Conservation and Land Management (CALM), 1993, *Ten Mile Brook Dam Recreation Plan*, CALM, Perth.

Department of Agriculture, Department of Environment, Dairy Industry of Western Australia, 1998, *Environmental Management Guidelines for Animal-based Industries – Dairy Farm Effluent, Bulletin 4436*, DoA, Perth.

Department of Environment Water Quality Protection Notes (available at: http://drinkingwater.environment.wa.gov.au)

- *Mechanical Servicing and Workshop Facilities (1998)*
- *Underground Chemical Storage Tanks (1999)*
- *Extractive Industries (2000)*
- *Wineries (2002)*
- *Buffers to Sensitive Water Resources (Draft, 2005)*

Forest Products Commission (FPC), 1999, *Code of Practice for Timber Harvesting in WA*, FPC, Perth.

Forest Products Commission (FPC), 2003, *Contractors' Timber Harvesting Manual: South-west Native Forests*, FPC, Perth.

NHMRC and ARMCANZ, 1996, *National Water Quality Management Strategy: Australian Drinking Water Guidelines*, National Health & Medical Research Council and Agriculture & Resource Management Council of Australia and New Zealand, Canberra.

Potato Growers Association of WA, 2002, *Code of Practice for Environmentally Sustainable Vegetable and Potato Production in Western Australia*, PGA & VGA, Perth.

Regional Development Council of Western Australia (RDCWA), 2002, *Regional Trends and Indicators, Shire of Augusta- Margaret River*, RDC, Perth.

Regional Forest Agreement for the South West Forest Region of Western Australia, 1999.

Water Corporation, 2004, *Sanitary Survey for the Margaret River Catchment Area*.

Water and Rivers Commission, 1996, *Busselton-Walpole Region Water Resource Review and Development Plan: Vol. I*, WRC, Perth.

Water and Rivers Commission, Department of Environmental Protection, Department of Agriculture, Wine Industry Assoc. of WA, Grape Growers Assoc. of WA, 2002, *Environmental Management Guidelines for Vineyards*, WRC, Perth.

Water and Rivers Commission, 2003, Statewide Policy No.11 *Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land*, WRC, Perth.

Water Authority of Western Australia, 1994, *Margaret River and Ten Mile Brook Catchment management plan 1993 – 1998*: Water Authority of Western Australia Surface Water Report WS 128, WAWA, Perth.

Western Power, 2004, *Environmental Policy for Wet Areas*, WPC, Perth.

Appendix 1 - Ten Mile Brook Dam water quality

The Water Corporation has monitored the quality of water from Ten Mile Brook and Margaret River Dam in accordance with *Australian Drinking Water Guidelines* (NHMRC & ARMCANZ, 1996) and interpretations agreed to with the Department of Health. Following is a summary of water quality monitored over the last 5 years in the Ten Mile Brook Dam. Data collected is current to October 2003. The monitoring program is continuing.

Heath Related Water Quality

Microbiological Data

Over the past 5 years there have been several detections of thermotolerant coliforms greater than 20 cfu/100 ml in the Margaret River raw water. These detections indicate faecal matter may have reached the water body. While chlorination is generally effective in managing this, all systems have the potential to fail. Chlorination alone is insufficient to protect water quality. The Water Corporation is in the process of building a treatment plant at Margaret River and in the interim has UV in place to control *Cryptosporidium*.

Health Related Chemical Data

There have been no detections of health related chemicals.

Aesthetic Water Quality

Parameter	Range of Monitored Values	Guideline Value#
Salinity (TFSS)	108-230 mg/L	1 000 mg/L
Hardness (CaCo3)	22-49 mg/L	200 mg/L
Turbidity	0.3-27 NTU	5 NTU
pH	6.11-7.3	6.5-8.5
Colour	2-34 TCU	15 TCU
Iron	0.07-1.2 mg/L	0.3 mg/L
Manganese	0.004-0.15 mg/L	0.1 mg/L
Aluminium	0.008-0.8 mg/L	0.2 mg/L
Nitrite + Nitrate (N)	0.05-0.095 mg/L	11 mg/L

From NHMRC Australian Drinking Water Guidelines 'Aesthetic Guidelines' (1996)

Generally Margaret River raw water complies with the aesthetic drinking water guideline values apart from the occasional fluctuation of iron and aluminium that is thought to be due to natural variation.

Appendix 2 - Compatibility of recreational activities within the Margaret River and Ten Mile Brook Dam Catchment Areas

The following tables assume that recreation will occur at approved established recreational sites within the catchment. For activities within the catchment outside these approved sites, an application will need to be made to the Water Corporation and CALM for permit approval.

Land based recreation

Activity	Ten Mile Brook Dam RPZ and Intake Pool on Margaret River	Priority 1 areas
Camping / Overnight Stay on Crown Land		
Camping/caravanning	Prohibited	Conditional**/***
Backpacking	Prohibited	Compatible with conditions**/***
Vehicular Access on Crown Land		
Coach tours	Prohibited	Compatible with conditions**/***
Nature based tourism	Prohibited	Compatible with conditions **/***
Off road / four wheel driving	Prohibited	Compatible with conditions**/***/Ø
Pleasure / scenic driving	Prohibited	Compatible with conditions*
Public Access on Crown Land		
Abseiling, search and rescue training	Prohibited	Compatible with conditions**
Amateur astronomy	Prohibited	Compatible with conditions*
Bird watching	Prohibited	Compatible with conditions*
Photography / painting	Prohibited	Compatible with conditions*
Research / environment study	Prohibited	Compatible with conditions*
Sightseeing	Prohibited	Compatible with conditions*
Abseiling / rock climbing (informal)	Prohibited	Compatible with conditions*/***
Abseiling / rock climbing (formal)	Prohibited	Compatible with conditions**
Barbecue / picnicking	Prohibited	Compatible with conditions*/***
Bushwalking / hiking (informal)	Prohibited	Compatible with conditions*/***
Bushwalking / hiking (formal)	Prohibited	Compatible with conditions**
Bush skills and navigation exercises	Prohibited	Compatible with conditions**
Four wheel drive courses	Prohibited	Compatible with conditions**
Military training	Prohibited	Compatible with conditions**
Mountain bike riding (informal)	Prohibited	Compatible with conditions*/***
Mountain bike riding (formal)	Prohibited	Compatible with conditions**
Orienteering (informal)	Prohibited	Compatible with conditions*/***
Orienteering (formal)	Prohibited	Compatible with conditions**
Rogaining (informal)	Prohibited	Compatible with conditions*/***
Rogaining (formal)	Prohibited	Compatible with conditions**
Firewood gathering	Prohibited	Compatible with conditions***

Activity	Ten Mile Brook Dam RPZ and Intake Pool on Margaret River	Priority 1 areas
Native flora and fauna removal	Prohibited	Compatible with conditions ©/***
Prospecting	Prohibited	Compatible with conditions **
Rock / gravel removal	Prohibited	Compatible with conditions ©/**
Animal Access on Crown Land		
Horse riding	Prohibited	Compatible with conditions **/***
Other animal trails	Prohibited	Compatible with conditions **/***
Training / exercising domestic animals	Prohibited	Incompatible
Hunting on Crown Land in Surface Water Catchment Areas		
Hunting / shooting	Prohibited	Compatible with conditions**
Introduction of game animals	Prohibited	Incompatible

* subject to water quality protection management guidelines

** may only be undertaken in accordance with a permit or written approval

*** may only be undertaken at a designated site in accordance with conditions displayed on a sign

ø prohibited in, or within 100 metres of, a water body

© CALM approval required

Water based recreation

Activity	Ten Mile Brook Dam RPZ and Intake Pool on Margaret River	Margaret River Foreshore Reserve in the farming area	Margaret River – State Forest
Boating (non motorised)			
Informal canoeing, rowing sailing	Prohibited	Compatible	Compatible
Organised canoeing, rowing sailing (clubs/large groups)	Prohibited	Compatible with conditions**	Compatible with conditions**
Windsurfing	Prohibited	Incompatible	Incompatible
Model boating	Prohibited	Compatible with conditions**	Compatible with conditions***
Boating (motorised)			
Jet skis	Prohibited	Incompatible	Incompatible
Power boats	Prohibited	Incompatible	Incompatible
Water skiing	Prohibited	Incompatible	Incompatible
Swimming			
Swimming/wading	Prohibited	Compatible	Compatible with conditions***
Scuba diving	Prohibited	Incompatible	Incompatible
Fishing			
Informal fishing	Prohibited	Compatible	Compatible
Organised fishing (clubs & large groups)	Prohibited	Compatible with conditions**	Compatible with conditions**
Marroning (snare)	Prohibited	Incompatible	Incompatible†
Introduction of fish/aquatic species	Prohibited	Incompatible	Incompatible

* subject to water quality protection management guidelines

** may only be undertaken in accordance with a permit or written approval

*** may only be undertaken at a designated site in accordance with conditions displayed on a sign

† allowed upstream of Canebreak Pool

Appendix 3 - Water Quality Protection Note

LAND USE COMPATIBILITY IN PUBLIC DRINKING WATER SOURCE AREAS (JULY 2004)

Purpose

The Department of Environment (DoE) is responsible for managing and protecting the State's water resources. This note provides advice on the acceptability of land uses and activities within specific catchments that are the water source for schemes supplying cities and towns. These catchments are termed Public Drinking Water Source Areas (PDWSAs) and they require comprehensive water resource quality and land planning protection measures to ensure the ongoing availability of a 'safe, good quality drinking water' supply to protect the health of consumers for now and into the future. This note supports the DoE's *Public Drinking Water Resource Policy* (July 2004).

The note also forms an integral part of the Western Australian Planning Commission's *Statement of Planning Policy No. 2.7- Public Drinking Water Source Policy* 2003 (relevant to approximately 140 existing PDWSAs in Western Australia) prepared by the Department for Planning and Infrastructure under Section 5AA of the *Town Planning and Development Act 1928*. It is also intended to support the proposed Statement of Planning Policy for Water Resources designed to guide planning decisions in future PDWSAs. This note should be used by local government when developing local planning strategies, structure plans and Town Planning Schemes. It should also be used in the assessment of subdivision and other development applications. The note will also assist the development of formal guidelines on land use activities in PDWSA prepared in liaison with key stakeholders such as the Water Corporation, Department of Health, Department of Conservation and Land Management, Department of Agriculture, Department of Industry and Resources, Department for Planning and Infrastructure and local government.

A review of this note may occur within 12 months (depending on feedback) to reflect DoE's policy position (which is influenced by public consultation undertaken for PDWSAs), advances in technology or land use activity standards, and government decisions made concerning drinking water quality protection. This note may not consider all the circumstances that exist for planning strategies, plans and schemes across the State. Accordingly, changes to this note will only be considered if they apply broadly across the State. Other means of addressing localised special circumstances may be employed and the DoE will assist in achieving this outcome provided those changes do not place the PDWSA at a higher contamination risk.

Scope

This note provides the DoE's position on a range of land uses assessed against the Department's water quality protection strategy and management objectives within PDWSAs. Where a specific land use has not been covered in the accompanying tables, it should be referred to the Department's Water Source Protection Branch for assessment and a written response concerning its acceptability or any necessary water resource protection measures.

Public Drinking Water Source Area in Western Australia is the collective description for:

- Underground Water Pollution Control Areas,
- Water Reserves, and
- Catchment Areas,

declared under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*.

This note is intended to complement the statutory role and policy of State and local government authorities, but it does not override government policy or the need for proponents to fulfil their legal responsibilities for land use planning, and environmental, health, building or other necessary approvals.

PDWSA protection framework

The protection of PDWSAs relies on statutory measures available in water resource management and land use planning legislation. The DoE policy for the protection of PDWSAs includes three risk management based priority classification areas and two types of protection zones. The priority classification areas and protection zones are determined via specific Drinking Water Source Protection Plans (DWSPP) that are prepared in consultation with State government agencies, landowners, local government, and key industry and community stakeholders. Where a fully consulted DWSPP does not exist for a PDWSA, the DoE initially prepares Drinking Water Source Protection Assessment (DWSPA) documents to reflect readily available information for use in land use planning assessments and decision making.

Priority classification areas

Priority 1 (P1) classification areas are managed to ensure that there is **no degradation** of the drinking water source by preventing the development of potentially harmful activities in these areas. The guiding principle is **risk avoidance**. This is the most stringent priority classification for drinking water sources. P1 areas normally encompass land owned or managed by State agencies, but may include private land that is strategically significant to the protection of the drinking water source (e.g. land immediately adjacent to a reservoir). Most land uses create some risk to water quality and are therefore defined as '**Incompatible**' in P1 areas.

Priority 2 (P2) classification areas are managed to ensure that there is **no increased risk** of water source contamination/ pollution. For P2 areas, the guiding principle is **risk minimisation**. These areas include established low-risk land development (e.g. low intensity rural activity). Some development is allowed within P2 areas for land uses that are defined as either '**Compatible with conditions**' or '**Acceptable**'.

Priority 3 (P3) classification areas are defined to **manage the risk of pollution** to the water source from catchment activities. Protection of P3 areas is mainly achieved through guided or regulated environmental (risk) management for land use activities. P3 areas are declared over land where water supply sources co-exist with other land uses such as residential, commercial and light industrial development. Land uses considered to have significant pollution potential are nonetheless opposed or constrained.

Wellhead and reservoir protection zones

In addition to the three priority classification areas, specific protection zones are defined to protect drinking water sources from contamination in the immediate vicinity of water extraction facilities. Within these zones by-laws may prohibit, restrict or approve defined land uses and activities to prevent water source contamination or pollution. Special conditions, such as restrictions on storage and use of chemicals, may apply within these zones. The legislation is currently being reviewed to simplify and enhance the protection of public drinking water sources.

Wellhead protection zones (WHPZ) are used to protect underground sources of drinking water. They are circular (unless information is available to determine a different shape), with a radius of 500 metres in P1 areas, and 300 metres in P2 and P3 areas. WHPZ do not extend outside PDWSA boundaries. Reservoir protection zones (or '**prohibited zones**' as they are called in the by-laws) consist of a statutory 2 kilometre wide buffer area around the top water level of storage reservoirs in the Perth water supply area, and include the reservoir waterbody. The reservoir protection zones (RPZ) apply over Crown land and prohibit public

access to prevent contamination (physical, chemical and biological) of the source water. RPZ do not extend outside PDWSA boundaries. The DoE is currently considering a provision for RPZ buffer areas of less than 2 kilometres, and creation of consistent by-laws for country and Perth PDWSAs.

Special protection measures apply in WHPZ and RPZ (prohibited zones) as described in the by-laws under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* and the *Country Areas Water Supply Act 1947*.

The determination of priority classification areas or protection zones over land in a PDWSA is based on:

- the strategic importance of the land or water source,
- the local planning scheme zoning,
- form of land tenure, and
- existing approved land uses/activities.

The land use tables in this protection note directly apply to the three types of priority classification areas identified in DWSPP or agreed in specific *Land Use and Water Management Strategy* documents. Currently there are 45 DWSPPs available to guide land use planning decisions in PDWSAs, and (nearly 100) others are in development. In the absence of a DWSPP, the DoE recommends that planning decisions within any gazetted or proposed PDWSA are guided by DWSPA documents (where they exist) and the '**potential**' priority classification area or protection zone status of a proposal identified using **Diagram 1: Assessment of potential priority classification areas and protection zones** (overleaf).

Compatibility of land uses within PDWSAs

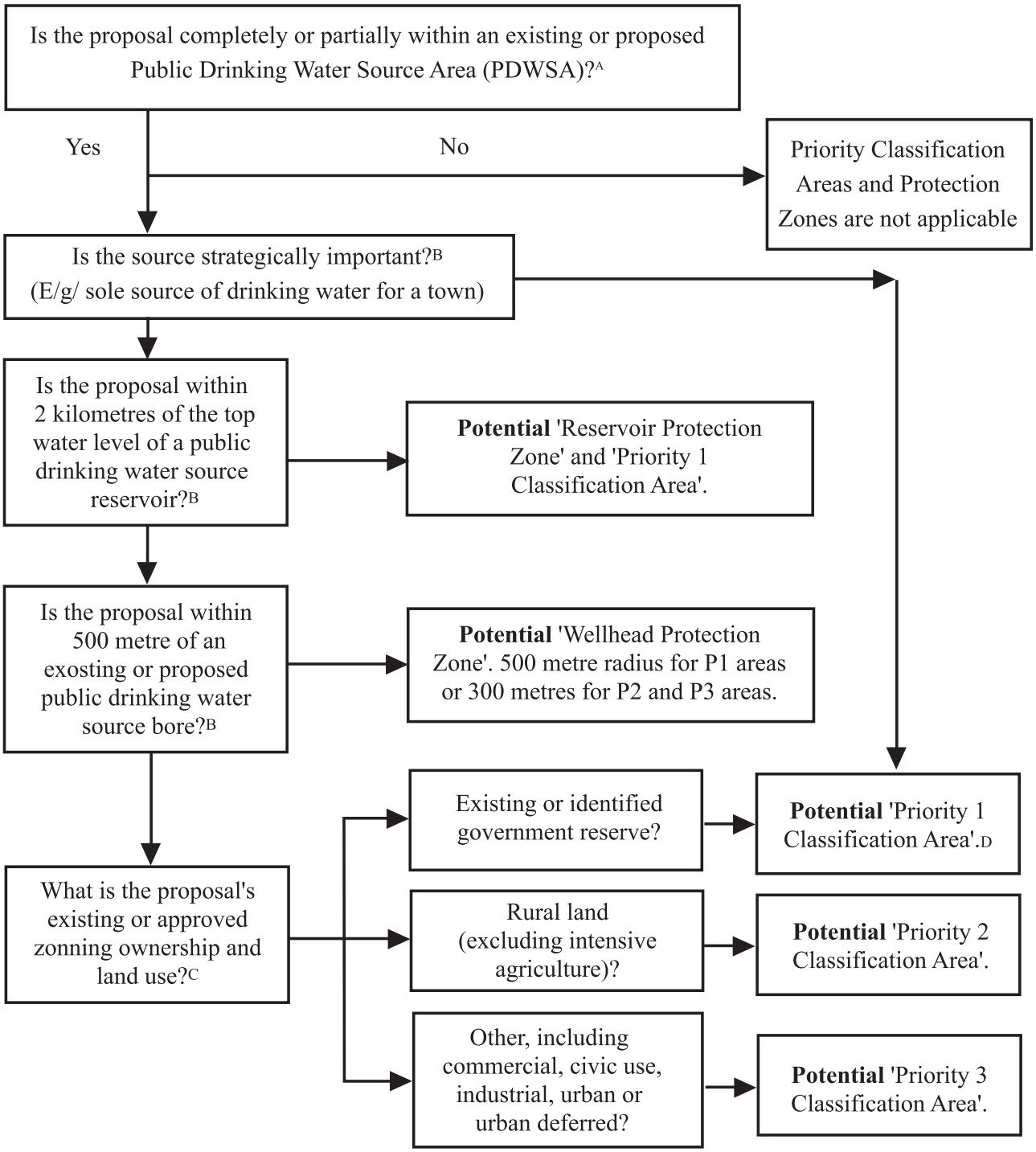
The tables in this note have been prepared for use by local governments, State planners and other agencies as a basis for regulating land use within PDWSAs. The note complements the Western Australian Planning Commission's *Statement of Planning Policy Number 2.7 - Public Drinking Water Source Policy* (June 2003). These tables define land uses in terms of their compatibility with the sustainable use of the drinking water source. They promote a priority for protection of the environmental value: 'drinking water' within a PDWSA over other values that may exists. The three definitions used are '**Incompatible**', '**Compatible with conditions**' and '**Acceptable**'. In previous versions of this note the definitions were 'Incompatible', 'Conditional' and 'Compatible'.

The DoE recognises that there may be special circumstances which may occasionally result in an '**Incompatible**' land use receiving approval. Where planning decisions result in this outcome it is important for project proponents to have demonstrated an overriding community benefit and that the land use will not increase the risk of contamination to the PDWSA. The DoE expects to have significant, early involvement in planning decisions of this nature to maximise the protection of the drinking water resource. It should be noted that where a water source is the sole supply for a community, or has a particularly high strategic value for the supply of drinking water, then it would be difficult to understand how that source might be put at any risk of contamination.

Detailed information on water quality protection issues and recommended best management practices for '**Compatible with conditions**' land uses are being developed in approved environmental policy, codes of practice, management guidelines and water quality protection notes. These documents, along with the most recent version of this note, can be found on the DoE Internet site http://www.environment.wa.gov.au. Information on land use and development regulation within PDWSAs can also be obtained from DoE's regional offices.

The DoE's Water Source Protection Branch, presently located in East Perth, is custodian of this water quality protection note and will provide detailed advice on its application and coordinate any suggested amendments.

Figure 1: Assessment of potential priority classification areas and protection zones



Legend

A. The location of PDWSAs can be found in DoE's Drinking Water Source Protection Assessments and Plans or through your regional DoE office, local government office, Water Corporation or from the Department for Planning and Infrastructure.

B. Strategically significant sources and potential contamination from land uses close to drinking water reservoirs or abstraction bores are considered first, as these involving the highest risk of contamination reaching consumers.

C. Current zoning or land use information is available from your local government office.

D. Government land is protected to achieve the highest level of safety for drinking water in all parts of a catchment through a Priority 1 classification, wherever this is reasonable and practicable.

Existing approved land uses

Many land uses covered in this note may have been legally established prior to establishment/ gazettal of the PDWSA or modern protection measures being required. The DoE policy is that existing approved land uses/ activities can continue at their presently approved level, provided they operate lawfully. Where necessary, negotiations may be arranged with landowners to acquire property rights in P1 source protection areas. Where practical, this agency will also negotiate with the operators of existing **'Incompatible'**, or **'Compatible with conditions'** activities to implement environmental management practices that minimise risks to water sources.

Proposed land uses

After reading this protection note, please view the DoE Internet site and/ or contact your nearest DoE Regional Office for advice on the location of PDWSAs, priority classification areas, and reservoir or wellhead protection zones. You may discuss with DoE staff any proposed land use activities that may affect water resources. The early identification of water resource protection issues in development stages of land use planning proposals is recommended in both the *Statement of Planning Policy Number 2.7 - Public Drinking Water Source Policy* (June 2003) and proposed *Water Resources Policy* by the Western Australian Planning Commission.

Definition of terms used in the following tables

'Acceptable ' (equivalent to 'compatible' in previous version of this note)- means the land use is accepted by DoE as not likely to harm the drinking water source, and is consistent with the management objectives of that priority classification. The adoption of best practice environmental management methods for new proposals to protect water quality is expected. Existing land users are also encouraged to adopt best practice environmental management methods to help protect water quality. These land uses generally do not need referral to the DoE.

'Compatible with conditions' (equivalent to 'conditional' in previous version of this note) - means the land use is likely to be accepted by DoE as not likely to harm the drinking water source (and is consistent with the management objectives of the priority classification), provided best environmental management practices are used. This may result in the application of 'specific conditions' (via the planning or environmental approval processes) that must be complied with to ensure the water quality objective of the priority area is maintained.

Land uses described as **'Compatible with conditions'** need only to be referred to DoE for assessment and a written response if the activity does not follow recommendations endorsed by DoE such as those made in policy, environmental management guidelines, protection notes, Ministerial conditions, works approvals, licences or agreements (e.g. a 'Memorandum of Understanding' developed between any local government and DoE).

'Incompatible'- means the land use is unacceptable to DoE as it does not meet the management objectives of the priority classification area. DoE will normally oppose approval of these land uses through the planning decision making process and under legislation administered by DoE. If planning decisions are made to approve these land uses (e.g. as a consequence of a planning appeals process), then DoE should be advised of that decision and have been directly involved in providing advice to the planning decision makers on water quality protection issues. It should be noted that contentious proposals may be referred to the EPA for Environmental Impact Assessment under the *Environmental Protection Act 1986*.

'Extensive'- means limited additional inputs beyond those supplied by nature are required to support the land use, e.g. for agriculture- animal feed supplements only during seasonal dry periods, or during the final preparation of stock for the market.

'Intensive'- means regular additional inputs are required to support the desired land use, e.g. for agriculture- irrigation, fertilisers, pesticides, or non-forage animal feeding dominates.

Interpretation of land use recommendations for planning schemes and development approvals

When using the following land use compatibility tables to guide planning schemes and development approval decisions, the following relationships should be used:

a) Where the table identifies a land use as '**Acceptable**', this use is permitted by DoE within that priority classification area. It may be identified as a '**P**' (permitted) use in a scheme, providing the use complies with the relevant development standards and requirements of the planning scheme.

b) Where the table identifies a use as '**Compatible with conditions**', this use should be a discretionary use within the priority classification area and should be identified as either a '**D**' or '**A**' (after special notice) use in the scheme. Proposals for '**Compatible with conditions**' uses should ONLY be referred to DoE for assessment and response if they do not meet existing agency policy, guidelines or protection note measures, unless prior agreement has been reached between a specific local government and DoE on alternative measures.

c) Relevant environmental management guidelines, codes of practice, water quality protection notes or agreements should be used in the first instance to define DoE's position on any land use and limit the need to refer proposals to the DoE. Where these do not exist, site specific advice may be provided by the DoE.

d) Where the table identifies a use as **'Incompatible'**, that use should not be permitted within that priority source protection area, and should be identified as an 'X' (unacceptable use) in the scheme.

Where the table does not include a proposed land use that could affect water quality, that use should be considered to be **'Incompatible'** until the proponent can demonstrate that it meets the drinking water quality protection objective of the designated priority classification area. Specific advice on the proposed land use should be obtained from the DoE's Water Source Protection Branch.

If the land use planning approval process supports a proposal that is inconsistent with this water quality protection note, then DoE Water Source Protection Branch should be advised of this situation and the reasons for that decision. This advice will trigger DoE's assessment of the significance/ consequence of that decision to the drinking water source and the outcome will be considered in future strategies for water quality protection, and in the periodic review and update of this note. A means to ensure the DoE's effective early involvement with such cases is currently being developed.

Tables defining compatibility of various land uses within PDWSA

It is important to note that this table provides the DoE's recommended compatibility of land uses for the current zoning of land. It must not be used to support rezoning of land to provide for more intensive land uses. For example, although P3 areas provide for high density urban development when the land is already zoned Urban or Urban deferred, this table must not be read to justify a zoning change within P3 areas to allow for high density urbanisation of rural zoned land.

Model Scheme Text (MST) land uses are shown in bold in the first column. Definitions covered in the MST (see note 23) can also be found in the Town Planning Amendment Regulations 1999.

Model Scheme Text & interpreted type of land use	**P1 areas**	**P2 areas**	**P3 areas**
Agriculture – extensive			
- pastoral leases	Compatible with conditions	Acceptable	Acceptable
- floriculture (non-irrigated), stock grazing (excluding pastoral leases) and broad hectare cropping	Incompatible	Compatible with conditions (see notes 11, 12)	Acceptable
Agriculture - intensive			
- aquaculture (fish, plants and crustaceans)	Incompatible	Compatible with conditions	Compatible with conditions
- orchards; production nurseries – potted plants; viticulture– wine and table grapes	Incompatible	Compatible with conditions	Acceptable
- floriculture; market gardens (see note 24); turf farms	Incompatible	Incompatible	Compatible with conditions
- hydroponic plant growing	Incompatible	Compatible with conditions	Compatible with conditions
- plant nurseries / garden centres	Incompatible	Compatible with conditions (see note 2)	Acceptable
Agro-forestry	Incompatible	Compatible with conditions	Acceptable
Amusement parlour	Incompatible	Incompatible	Acceptable (see note 1)
Animal establishment			
- animal saleyards and stockyards (see note 13)	Incompatible	Compatible with conditions (see note 2)	Compatible with conditions (see note 2)
- apiaries	Compatible with conditions	Acceptable	Acceptable
- catteries	Incompatible	Acceptable	Acceptable
- dairy sheds	Incompatible	Compatible with conditions (see notes 2, 3, 12)	Compatible with conditions (see note 3)
- dog kennels	Incompatible	Compatible with conditions	Compatible with conditions
- equestrian centres (see note 17)	Incompatible	Incompatible	Acceptable
- feedlots, intensive outdoor livestock holding	Incompatible	Incompatible	Compatible with conditions
- stables (see note 18)	Incompatible	Compatible with conditions	Acceptable
Animal husbandry - intensive			
- piggeries	Incompatible	Incompatible	Incompatible
- poultry farming - housed	Incompatible	Compatible with conditions	Compatible with conditions

Model Scheme Text & interpreted type of land use	**P1 areas**	**P2 areas**	**P3 areas**
Bed and breakfast (accommodating a max of 6 guests)	Compatible with conditions (see notes 6, 16)	Acceptable (see note 23)	Acceptable
- farm stay accommodation, rural chalets)	Compatible with conditions (see notes 6, 16)	Compatible with conditions (see note 4)	Acceptable
Betting agency	Incompatible	Compatible with conditions (see note 2)	Acceptable (see note 1)
Caravan park	Incompatible	Incompatible	Compatible with conditions (see note 1)
Caretakers dwelling	Compatible with conditions (see note 2)	Compatible with conditions	Acceptable
Car park	Incompatible	Compatible with conditions (see note 2)	Acceptable
Cemeteries	Incompatible	Incompatible	Compatible with conditions
Child care premises	Incompatible	Compatible with conditions (see note 2)	Acceptable (see note 1)
Cinema/theatre	Incompatible	Incompatible	Acceptable (see note 1)
Civic use	Incompatible	Compatible with conditions (see note 1)	Acceptable (see note 2)
Club premises			
- sporting or recreation clubs (see note 1)	Incompatible	Compatible with conditions	Acceptable
- health centres (see note 1)	Incompatible	Incompatible	Acceptable
Community purpose			
- community halls	Incompatible	Compatible with conditions (see note 2)	Acceptable
- irrigated golf courses or recreational parks	Incompatible	Incompatible	Compatible with conditions (see note 11)
- motor-sports (permanent racing facilities)	Incompatible	Incompatible	Compatible with conditions
- public swimming pools/ aquatic centres	Incompatible	Incompatible	Compatible with conditions

Model Scheme Text & interpreted type of land use	**P1 areas**	**P2 areas**	**P3 areas**
- rifle ranges	Incompatible	Compatible with conditions	Acceptable
Consulting rooms	Incompatible	Compatible with conditions (see note 2)	Acceptable (see note 1)
Convenience store	Incompatible	Compatible with conditions (see note 2)	Acceptable (see note 1)
Corrective institution	Incompatible	Incompatible	Compatible with conditions (see note 1)
Educational establishment			
- community education centres, scientific research institution	Compatible with conditions (see note 2)	Compatible with conditions (see note 2)	Acceptable (see note 1)
- primary / secondary schools, tertiary education facilities	Incompatible	Incompatible	Acceptable (see note 1)
Exhibition centre	Incompatible	Incompatible	Acceptable (see note 1)
Family day care	Incompatible	Acceptable (see note 19)	Acceptable (see note 1)
Fast food outlet	Incompatible	Incompatible	Acceptable (see note 1)
Forestry (native forest/ silviculture/ tree farming)	Compatible with conditions (see note 11)	Compatible with conditions (see note 11)	Acceptable
Fuel depot (storage/ transfer)	Incompatible	Incompatible	Compatible with conditions
Funeral parlour	Incompatible	Incompatible	Acceptable (see note 1)
Home business	Incompatible	Acceptable (see note 20)	Acceptable (see note 1)
Home occupation	Compatible with conditions (see note 15)	Acceptable (see note 21)	Acceptable (see note 1)
Home office	Compatible with conditions (see note 15)	Acceptable	Acceptable
Home store	Incompatible	Compatible with conditions	Acceptable (see note 1)
Hospital	Incompatible	Incompatible	Compatible with conditions (see note 1)
Hotel (includes hotels, hostels, resorts)	Incompatible	Incompatible	Acceptable (see note 1)

Model Scheme Text & interpreted type of land use	**P1 areas**	**P2 areas**	**P3 areas**
Industry			
- abattoirs	Incompatible	Incompatible	Incompatible
- cottage	Compatible with conditions	Compatible with conditions	Acceptable
- drinking water treatment plant	Compatible with conditions	Compatible with conditions	Compatible with conditions
- extractive, includes construction/ mining camps (see note 10)	Compatible with conditions	Compatible with conditions	Compatible with conditions
- food processing, dairy product factories, breweries	Incompatible	Incompatible	Compatible with conditions (see note 1)
- general (chemical manufacture/ formulation, dry cleaners, dye works, laboratories, photo-processors)	Incompatible	Incompatible	Compatible with conditions see note 1)
- general (metal production/ finishing, pesticide operator depots, heavy or energy industry, petroleum refineries)	Incompatible	Incompatible	Incompatible
- general (concrete batching, cement products, fertiliser manufacture/ bulk storage, wrecking)	Incompatible	Incompatible	Compatible with conditions
- general (mineral processing)	Incompatible	Incompatible	Compatible with conditions (see note 9)
- light industry	Incompatible	Incompatible	Compatible with conditions (see note 1)
- milk transfer depots	Incompatible	Incompatible	Compatible with conditions
- mining (includes mineral and energy exploration, oil or gas extraction/ decontamination for transport)	Compatible with conditions (see note 9)	Compatible with conditions (see note 9)	Compatible with conditions (see note 9)
- mining (tailings dams)	Incompatible	Incompatible	Compatible with conditions (see note 9)
- mining (includes construction/ mining camps), (see note 10)	Compatible with conditions	Compatible with conditions	Compatible with conditions
- rural (animal product rendering works, tanneries, wool scourers)	Incompatible	Incompatible	Incompatible
- rural (farm supply centres, manure stockpiling/processing facilities)	Incompatible	Compatible with conditions (see note 2)	Compatible with conditions
- rural (forestry products processing – chip mills, pulp/ paper, timber preservation, wood/ fibre works, composting/ soil blending - commercial)	Incompatible	Incompatible	Compatible with conditions
- service industry	Incompatible	Incompatible	Compatible with conditions

Model Scheme Text & interpreted type of land use	**P1 areas**	**P2 areas**	**P3 areas**
Landfill (solid waste disposal)			
- class I (refer also to 'Storage - used tyres' advice)	Incompatible	Incompatible	Compatible with conditions
- class II or III	Incompatible	Incompatible	Incompatible
- class IV or V	Incompatible	Incompatible	Incompatible
Lunch bar	Incompatible	Compatible with conditions (see note 2)	Acceptable (see note 1)
Major transport infrastructure (roads, railways)	Incompatible	Compatible (see note 14)	Acceptable with conditions
Marina (includes boat moorings and servicing)	Incompatible	Incompatible	Compatible with conditions
Marine filling station (boat fuelling)	Incompatible	Incompatible	Compatible with conditions
Market (food; general produce; second–hand goods)	Incompatible	Incompatible	Acceptable (see note 1)
Medical centre	Incompatible	Incompatible	Acceptable (see note 1)
Motel	Incompatible	Incompatible	Acceptable (see note 1)
Motor vehicle, boat or caravan sales (sales yards)	Incompatible	Incompatible	Acceptable (see note 1)
Motor vehicle repair	Incompatible	Incompatible	Compatible with conditions
Motor vehicle wash	Incompatible	Incompatible	Compatible with conditions
National and regional parks and nature reserves	Acceptable	Acceptable	Acceptable
Night club	Incompatible	Incompatible	Acceptable (see note 1)
Office	Incompatible	Compatible with conditions	Acceptable (see note 1)
Park home	Incompatible	Incompatible	Compatible with conditions (see note 1)
Place of worship	Incompatible	Incompatible	Acceptable (see note 1)
Plantation	Compatible with conditions (see note 11)	Compatible with conditions (see note 11)	Acceptable (see note 11)
Reception centre	Incompatible	Incompatible	Acceptable (see note 1)
Recreation – private (within non-designated recreation areas on Crown land)	Incompatible	Incompatible	Acceptable

Model Scheme Text & interpreted type of land use	**P1 areas**	**P2 areas**	**P3 areas**
Residential building			
- house	Compatible with conditions (see note 16)	Acceptable (see note 4)	Acceptable (see note 4)
- group dwellings (aged and dependent persons)	Incompatible	Incompatible	Acceptable (see note 1)
Restaurant	Incompatible	Incompatible	Acceptable (see note 1)
Restricted premises (adult interests)	Incompatible	Incompatible	Acceptable (see note 1)
Rural pursuit	See Agriculture, Animal establishment or husbandry		
Service station (includes aircraft, automotive repairs, boats, mechanical plant, service stations at transport and municipal works depots)	Incompatible	Incompatible	Compatible with conditions (refer to note 1)
Shop	Incompatible	Compatible with conditions (see note 2)	Acceptable (see note 1)
Showroom	Incompatible	Incompatible	Acceptable (see note 1)
Storage			
- used tyres (see note 22)	Incompatible	Incompatible	Incompatible
- chemical storage in under ground tanks	Incompatible	Incompatible	Compatible with conditions
- chemical storage in above ground tanks	Incompatible	Compatible with conditions	Compatible with conditions
Tavern	Incompatible	Incompatible	Acceptable (see note 1)
Telecommunications infrastructure	Compatible with conditions	Compatible with conditions	Compatible with conditions
Toilet blocks and change rooms	Compatible with conditions (see note 2)	Compatible with conditions	Acceptable
Trade display	Incompatible	Incompatible	Acceptable (see note 1)
Veterinary centre	Incompatible	Compatible with conditions (see note 2)	Compatible with conditions (see note 1)
Warehouse	Incompatible	Compatible with conditions (see note 2)	Compatible with conditions (see note 1)
Waste transfer station (includes recycling depots)	Incompatible	Incompatible	Compatible with conditions

Model Scheme Text & interpreted type of land use	**P1 areas**	**P2 areas**	**P3 areas**
Wastewater infrastructure			
- sewerage – gravity sewers	Incompatible	Incompatible	Acceptable
- sewerage – pressure mains	Incompatible	Compatible with conditions	Acceptable
- sewer pump stations	Incompatible	Compatible with conditions	Compatible with conditions
- treatment plants, wastewater disposal to land	Incompatible	Incompatible	Compatible with conditions
- wastewater injection into the ground (see note 25)	Incompatible	Incompatible	Incompatible
Water treatment plants (drinking)	See Industry		
Winery (includes wine tasting facilities)	Incompatible	Compatible with conditions (see notes 3 & 5)	Compatible with conditions (see note 3)

Table recommending compatibility of land subdivision within PDWSA: Note - This table reflects the recommended size of a subdivision based on the existing zoning and the priority classification area status of land. It should be noted that Town Planning Scheme provisions for specific zones and reserves will take precedence over the following recommended lot sizes.

Form of subdivision (specific to current zoning)	**P1 areas**	**P2 areas**	**P3 areas**
Rural subdivision			
- to a lot size of 4 hectares or greater	Incompatible	Acceptable	Acceptable
- to a lot size less than 4 hectares	Incompatible	Incompatible	Incompatible
Special rural subdivision			
- to a lot size of 2 hectares or greater	Incompatible	Compatible with conditions (see notes 7 & 8)	Compatible with conditions (see note 8)
- to a lot size between 1 and 2 hectares	Incompatible	Incompatible	Compatible with conditions (see notes 7 & 8)
- to a lot size less than 1 hectare	Incompatible	Incompatible	Compatible with conditions (see note 7)
Urban subdivision	Incompatible	Incompatible	Acceptable (see note 1)
Industrial subdivision	Incompatible	Incompatible	Acceptable (see note 1)

Explanatory notes related to land uses described in the tables:

The following notes provide interpretive information based on the scale or type of development described in the preceding tables. They do not list all the conditions that could apply to any activity or development.

1. Must be connected to deep sewerage, except where exemptions apply under State Government Sewerage Policy. The Policy recognises that sewer connection may be impractical in some areas. Under these circumstances maximum wastewater loadings (based on people/ hectare) apply linked to the management priority of the site.

2. The land use is normally incompatible, but may be conditionally approved where this facility is consistent with approved State and local government planning strategies or schemes.

3. The land use must incorporate best environmental management practices compatible with the management strategy for the designated priority area defined in the relevant source protection plan.

4. In Priority 2 areas, conditions may apply to density of dwellings (i.e. hectares per dwelling).

5. Size of the grape crush shall not exceed 500 tonnes per year.

6. May be approved if occupancy is of equivalent size to a single dwelling household (i.e. less than 10 people– defined by capacity of a septic tank based on-site wastewater treatment system).

7. An average, rather than minimum, lot size may be accepted if the proponent can demonstrate that the water quality objectives of the source protection area are met, and caveats/memorials are placed on titles of specified blocks stating that further subdivision shall not occur.

8. Lots should only be created where land capability assessment shows that effective on-site soakage of treated wastewater can be achieved. Conditions apply to siting of wastewater disposal systems in areas with poor land drainage and/ or a shallow depth to groundwater, and where animals are held or fertiliser is applied. Alternative wastewater treatment systems, where approved by the Department of Health, may be accepted with ongoing maintenance requirements.

9. Conditions are likely to be placed via a Department of Industry and Resources mineral tenement lease, and / or as a result of Minister for the Environment's approval after an Environmental Impact Assessment.

10. Conditions apply to the storage of fuels and chemicals, the depth of excavation related to the water table and rehabilitation criteria. Underground fuel or chemical storage tanks are prohibited via DoE by-laws in Priority 1 and 2 areas within Underground Water Pollution Control Areas.

11. Conditions apply to regulate fertiliser and pesticide application.

12. Can be approved if animal stocking levels (animals per hectare, guided by the Department of Agriculture's stocking rate guidelines) are consistent with the priority source protection area objectives.

13. This does not include stockyards occasionally used on farms or pastoral leases for animal husbandry.

14. Conditions may be imposed to cover design, construction of infrastructure and the types of goods.

15. May only be approved if *Home Occupation* relates to an existing residence.

16. Limited to one residential building per property.

17. Includes land or buildings dominantly used for the showing, competition or training of horses, and riding schools.

18. Includes any land, building or structure used for equine (e.g. horses, asses, mules and donkeys) housing, keeping and feeding and associated activities.

19. In accordance with *Community Services (Child Care) Regulations 1988*: 'A child care service provided to a child in a private dwelling in a family or domestic environment. No more than 5 children of pre-school age and no more than 7 children under 12 years old, including the children of the licensee or permit holder.'

20. No more than 2 employees, and the home business occupies an area up to 50 square metres. Compatible if only an office/ administrative business (i.e. overnight parking of only one commercial vehicle, no refuelling or repair/ maintenance of business vehicles, and no activities involving on-site use, storage or disposal of chemicals or process wastewater).

21. Employees shall be members of the household, and the home business occupy an area of up to 20 square metres. No provision for refuelling, repair or maintenance of commercial/ business vehicles or on-site use or storage of chemicals.

22. Used tyre use, storage and disposal are subject to Used Tyre Regulations 1996, administered by the this agency.

23. As defined in the *Model Scheme Text* (1997) or the *Residential Design Codes of Western Australia* (2002) prepared by the Western Australian Planning Commission, and covering local government planning schemes.

24. Applies to the commercial production of horticultural crops, e.g. vegetables, flowers and fruit crops grown in contact with the ground. Does not apply to cereal or oil seed crops, perennials (e.g. orchards, vineyards, nuts) or any crop grown separate from contact with soils in the natural environment, e.g. hydroponics.

25. The use of recycled (reclaimed) water to address the diminishing level of scheme water supply in Western Australia is currently being investigated by government. The social, environmental, health and economic issues related to this option are significant and need to be further progressed before its applicability in PDWSA is reconsidered.

Appendix 4 - Plates

Plate 1: Ten Mile Brook Dam

Plate 2: Rosa Brook Townsite

Plate 3: Margaret River

Plate 4: Dairying – Margaret River Catchment

Plate 5: Olive orchard– Margaret River

Plate 6. Recreation at Canebreak Pool

Publication feedback form

The Water and Rivers Commission welcomes feedback to help us to improve the quality and effectiveness of our publications. Your assistance in completing this form would be greatly appreciated.

Please consider each question carefully and rate them on a 1 to 5 scale, where 1 is poor and 5 is excellent (please circle the appropriate number).

How did you rate the quality of information?

1 2 3 4 5

How did you rate the design and presentation of this publication?

1 2 3 4 5

How can it be improved?

1 2 3 4 5

.....

How effective did you find the tables and figures in communicating the data?

1 2 3 4 5

How can they be improved?

.....

.....

.....

How did you rate this publication overall?

1 2 3 4 5

If you would like to see this publication in other formats, please specify. (Eg. CD)

.....

Please cut along the dotted line on the left and return your completed response to:

Publications Coordinator
Department of Environment
Level 2, Hyatt Centre
3 Plain Street
East Perth WA 6004
Fax: (08) 9278 0639

www.environment.wa.gov.au

Westralia Square
Level 8 141 St Georges Terrace
Perth Western Australia 6000
PO Box K822 Perth Western Australia 6842
Telephone (08) 9222 7000
Facsimile (08) 9322 1598
E-mail info@environment.wa.gov.au
www.environment.wa.gov.au

Hyatt Centre
Level 2 3 Plain Street
East Perth Western Australia 6004
PO Box 6740 Hay Street East Perth Western Australia 6892
Telephone (08) 9278 0300
Facsimile (08) 9278 0301
National Relay Service (Australian
Communication Exchange) 132 544
E-mail info@environment.wa.gov.au
www.environment.wa.gov.au