

**Kemerton wastewater treatment plant and  
treated wastewater reuse at Woodlot  
Binningup**

---

**Water Corporation**

**Report and Recommendations  
of the Environmental Protection Authority**

**Environmental Protection Authority  
Perth, Western Australia  
Bulletin 1011  
April, 2001**

ISBN. 0 7307 6635 7

ISSN. 1030 - 0120

Assessment No. 1376

# Contents

	<b>Page</b>
<b>1. Introduction</b>	<b>1</b>
<b>2. The proposal</b>	<b>2</b>
2.1 Existing wastewater treatment plants at Eaton and Australind	2
2.2 Proposed wastewater and biosolids management system at Kemerton wastewater treatment plant	6
<b>3. Community consultation</b>	<b>8</b>
<b>4. Relevant environmental factors</b>	<b>9</b>
4.1 Surface and groundwater quality	9
4.2 Terrestrial vegetation and wetlands	12
<b>5. Conclusion</b>	<b>14</b>
<b>6. Recommendations</b>	<b>17</b>
 <b>Figures</b>	
1. Location of proposal	4
2. Infill sewerage area for Australind and Eaton	5
3. Wastewater treatment process at Kemerton	7
4. Major surface water drainage	10
5. Plant layout showing vegetation and proposed construction at Kemerton site	13
6. Woodlot layout in Binningup	15
7. Wetlands in the vicinity of the proposal	16
 <b>Tables</b>	
1. Summary of key proposal characteristics	3
 <b>Appendices</b>	
1. References	
2. Recommended Environmental Conditions and Proponent's Consolidated Commitments	

## 1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by the Water Corporation to construct a new Wastewater Treatment Plant (WWTP) at Kemerton and woodlot for irrigation of the treated wastewater at Binningup.

A definition report and an initial proposal was submitted to the Department of Environmental Protection (DEP) in September 2000, as a Notice of Referral (Kinhill, 2000). Following discussions with the DEP, Leschenault Inlet Management Authority (LIMA) and the Water and Rivers Commission (WRC), the proponent has subsequently provided a modified proposal, which presented additional information on options of wastewater management particularly in relation to nutrient management.

The proponent has described the proposal, the management of environmental issues, provided a list of key stakeholders consulted and a table of the proponent's commitments.

In summary, the commitments are to:

- protect native vegetation during construction works;
- protect groundwater and surface water quality by preparing a Nutrient and Irrigation Management Plan for the woodlot;
- design and implement a monitoring program including installation of groundwater monitoring bores to determine impact of irrigation on groundwater and surface water quality;
- prepare a mitigation strategy to address groundwater contamination in the event that monitoring shows that a groundwater plume is likely to enter Parkfield Drain and cause an adverse impact;
- maintain rainfed (tree) buffer to the west of the irrigated woodlot;
- construct and design wastewater storage dams and sludge lagoons with a synthetic or clay liner in accordance with Australian Standards to protect groundwater and surface water quality;
- prepare Environmental Management Plans for the construction of pipelines, pressure mains and transfer pumping stations;
- conduct a detailed archaeological survey to ensure that artifact sites will not be impacted;

The EPA set the level of assessment at EPA-initiated Environmental Protection Statement in accordance with Section 44 (1) of the *Environmental Protection Act 1986*. This level of assessment was decided upon by the EPA following discussions with the proponent and the submission of commitments which the EPA recommends be adopted by the Minister as legally binding environmental conditions.

Any person who disagrees with the EPA's decision on the level of assessment may lodge an appeal with the Minister for the Environment within 14 days of the date of the decision being placed in the public record.

A separate right of appeal exists for any person who disagrees with the content of, or any recommendations in this report, also within 14 days of release of the report.

The proponent has prepared an EPS document that accompanies this report and describes the project, its environmental impacts and the proposed approach to their management in greater detail. This document is available through the DEP library in Perth and the regional office in Bunbury.

## **2. The proposal**

The proposal being assessed is for the works and operation of a WWTP and woodlot reuse scheme for the first three years. This will enable monitoring and evaluation to be undertaken to determine a longer term strategy for development and operation of the scheme. The works and operation for the first three years form part of planned Stage 1 of the scheme, which will extend to the year 2010. A further two stages (extending to 2040) are planned for the future (Brown and Root, 2001).

The proposal (Figure 1) is to construct:

- an advanced activated sludge wastewater treatment plant at Kemerton (initial design capacity would be 3.6 ML/day);
- a 17 ML storage dam at the Kemerton WWTP;
- a treated wastewater pumping station located at Kemerton;
- a 9.0 km pipeline to deliver wastewater from Eaton and Australind to Kemerton WWTP;
- a 7.4 km pressure main to deliver reclaimed water to the woodlot site located near Binningup;
- a 10ML treated wastewater storage dam at the woodlot site; and
- a 60ha woodlot irrigation site at Binningup.

The key characteristics of the proposal are indicated in Table 1.

The proposal covers three general components: Kemerton WWTP site; the Woodlot site in Binningup; and the pipeline alignments from Eaton and Australind to Kemerton WWTP and from Kemerton WWTP site to the Woodlot.

The WWTP would replace the two existing WWTPs servicing Australind and Eaton as well as providing sufficient capacity to allow the implementation of a sewerage infill program within Australind and Eaton. This would facilitate the replacement of septic systems by connecting existing unsewered residences to the reticulated sewerage system. Redirection of wastewater from the two existing WWTPs in Eaton and Australind to the new Kemerton WWTP is planned to take effect from April 2002.

Treated wastewater from the Kemerton WWTP would be used to irrigate a woodlot located west of the Old Coast Road, approximately seven kilometers to the north in Binningup (Figure 1).

### **2.1 Existing Wastewater Treatment Plants at Eaton and Australind**

The current WWTPs at Australind and Eaton treat domestic wastewater from the sewered residential areas. Unsewered residential areas within these townships rely on septic tank systems to manage their domestic wastewater (Figure 2).

**Table.1 Summary of key proposal characteristics**

Item	Feature	Characteristic
Wastewater treatment plant	General description	Intermittently decanted extended aeration (IDEA) plant (or other equivalent plant) including at least two sludge lagoons and an on-site storage for treated wastewater.
	Location	Lot 26 Marriott Road, Kemerton
	Treatment capacity (Year 2010)	3.6 ML/d
	Projected flow (Year 2002)	2.0ML/d
	(Year 2003)	2.4ML/d
	(Year 2004)	2.8ML/d
	Inflow water quality	275 mg/L BOD (unfiltered) 300 mg/L SS 70 mg/L N 15 mg/L P
Treated water quality from WWTP (apart from commissioning)	20 mg/L BOD 20 mg/L SS 7.5 mg/L N (annual mean) 10 mg/L N (annual 75%-ile) 1.0 mg/L P (annual mean) 1.5 mg/L P (annual 75%-ile)	
On-site storage	17 ML	
Treated wastewater conveyance pipeline	Location	Northern side of the Sons of Gwalia haul road and Rosamel Road between the WWTP site and the Old Coast Road, then crossing to the western side of the Old Coast Road north to the woodlot site.  Design and pipeline alignment to be addressed in EMP and approved prior to construction of WWTP.
	Length (approximate)	7.4 km
	Size	225 mm diameter
	Flow rate (maximum for Stage 3)	71 L/s
Raw wastewater conveyance pipeline	Location	Pipeline from Australind WWTP to Kemerton WWTP. Design and pipeline alignment to be addressed in EMP and approved prior to construction of WWTP.
	Length (approximate)	9.0 km
Sewage pumping station facility	Location	Kemerton
Woodlot	General description	Irrigated Tasmanian blue gum ( <i>Eucalyptus globulus</i> ) plantation
	Location	Lot Nos D36882/3–5, D36635/2  South of Binningup Road and east of the Old Coast Road near Binningup.
	Area	Minimum 60 ha  <b>Note:</b> see commitment 7 to increase area of woodlot in subsequent years.
	On-site storage	10 ML

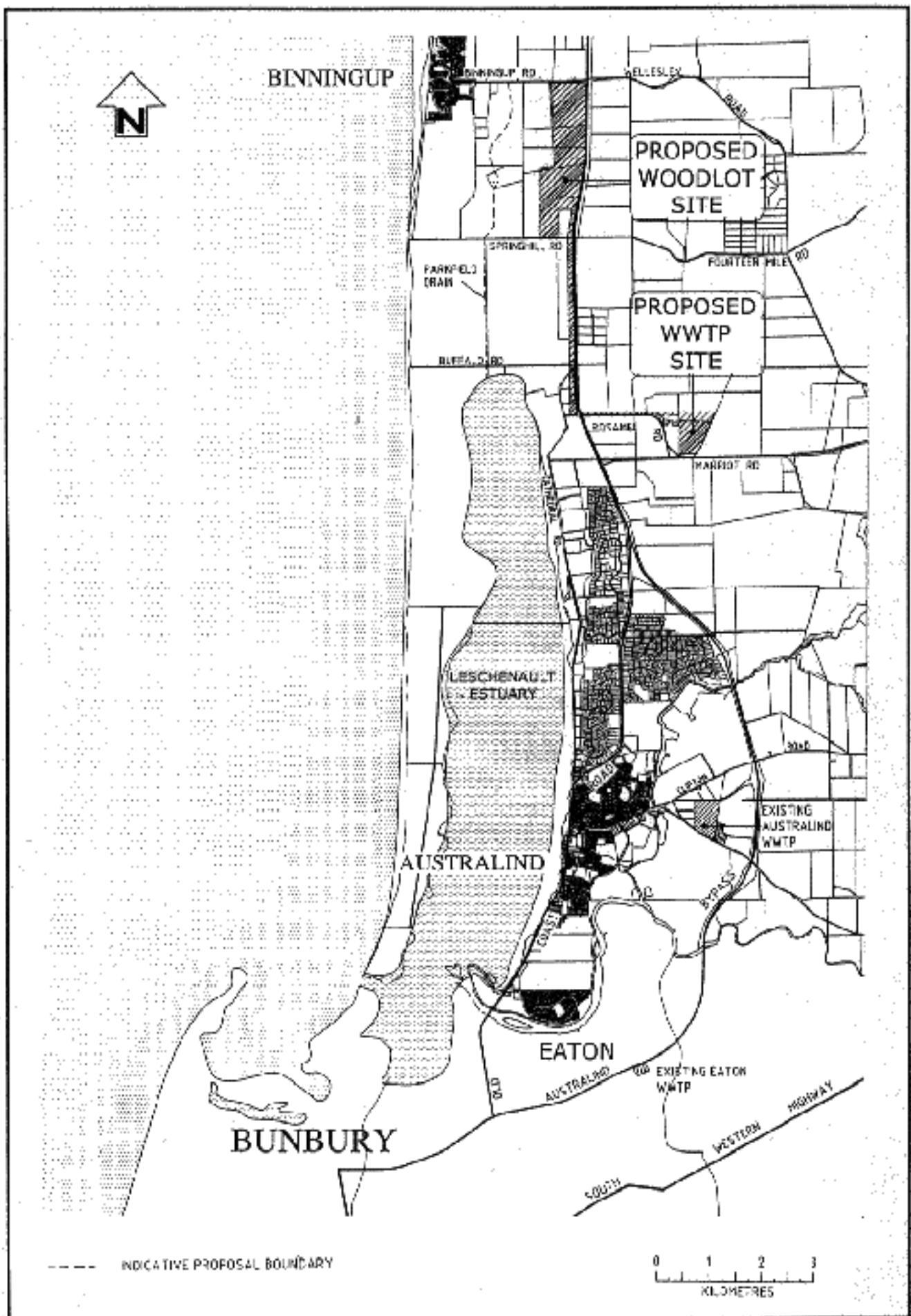


Figure 1. Location of proposal.

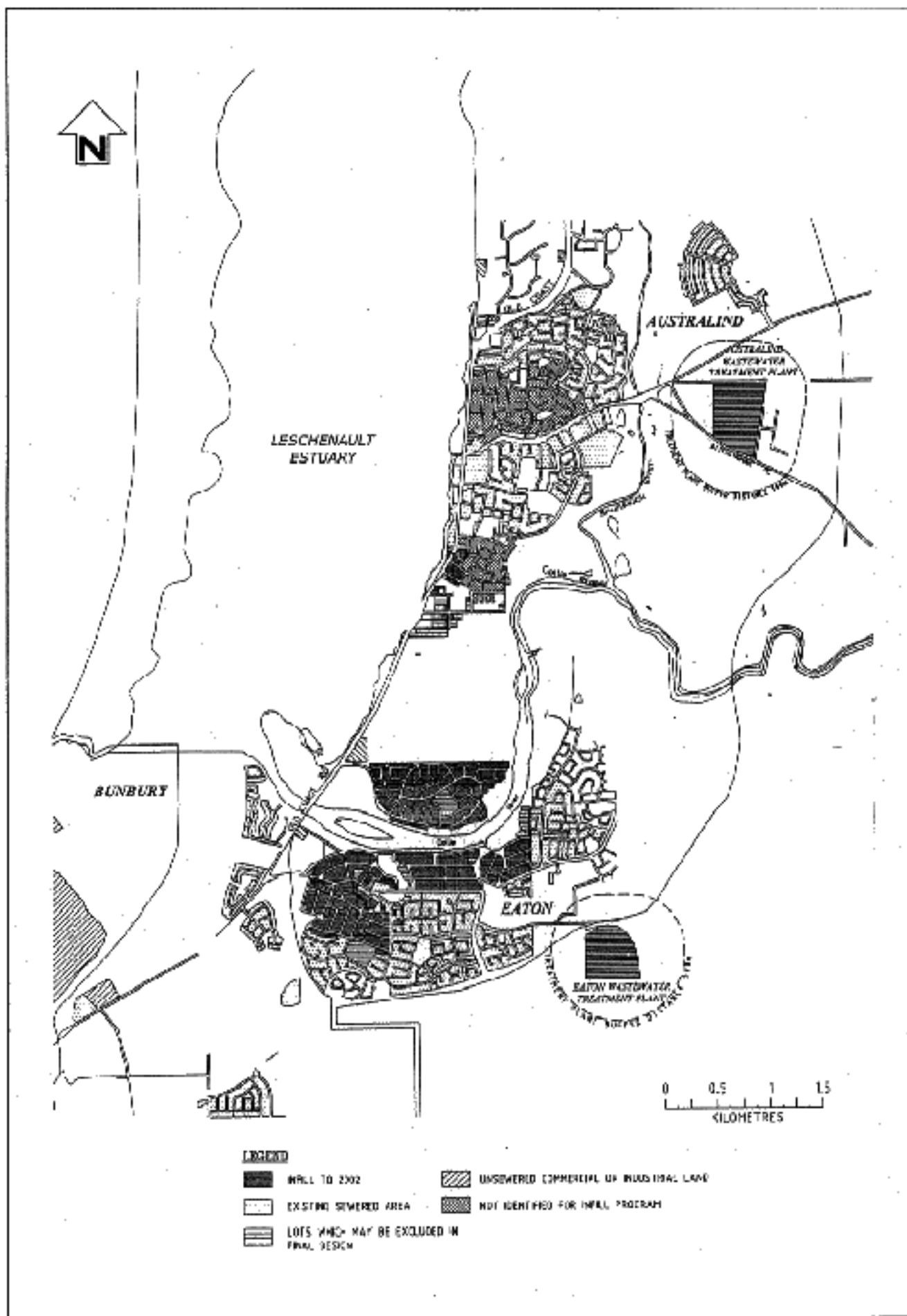


Figure 2. Infill sewerage area for Australind and Eaton.



While septic tanks are adequate to manage the immediate health implications associated with microorganisms they have proven inadequate for the management of nutrients in nutrient sensitive environments such as the Peel-Harvey and Swan Coastal Plain catchments (EPA 1997).

Treated wastewater from both of the existing WWTPs is disposed of via infiltration ponds located adjacent to each plant. The proponent has experienced overloading problems with the operation of the infiltration ponds at both sites. Expansion and upgrade of these facilities is required to meet the rapid growth in these areas. Wastewater is treated at Australind via the Intermittently Decanted Extended Aeration (IDEA) process that produces an effluent quality that typically has a total nitrogen of 5.6mg/L and total phosphorus of 1.6 mg/L.

Wastewater treatment at Eaton is less efficient with treated wastewater typically 35 mg/L total nitrogen and 2.9 mg/L total phosphorus. Chemical dosing to remove phosphorus is currently employed at both plants.

Sewage from the Eaton and Australind WWTPs will be pumped to the Kemerton WWTP for treatment via the pumping station facility and then pumped to a woodlot to be constructed at Kemerton.

Following diversion of wastewater to the new Kemerton WWTP, both the Eaton and Australind WWTPs will be decommissioned. This will involve restoring both sites to a condition that will enable redevelopment in accordance with planning and other legislative requirements.

## **2.2 Proposed Wastewater and Biosolids Management System at Kemerton Wastewater Treatment Plant**

The proposed treatment plant would be constructed in 3 stages to manage a projected wastewater capacity of 7.2 ML per day at year 2040.

Wastewater would be treated by the IDEA process (Figure 3) and would flow by gravity to a treated wastewater storage dam at the WWTP site via underground pipe work. The treated wastewater would then be pumped from the treated wastewater storage dam to the proposed woodlot via a 225 mm diameter pipeline. Biosolids produced during the treatment process would be pumped from the IDEA plant to biosolids storage lagoons.

Effluent quality for the plant will be similar to Australind with mean concentration of 7.5 mg/L nitrogen and 1.0mg/L phosphorus at Stage 1 development.

Process tanks would typically be 20-30 m in diameter with a depth of between 2.5 m and 4 m depending on the process used and the supplier. The tanks could also be rectangular with similar volumes. The tanks would be sited on a compacted sand base.

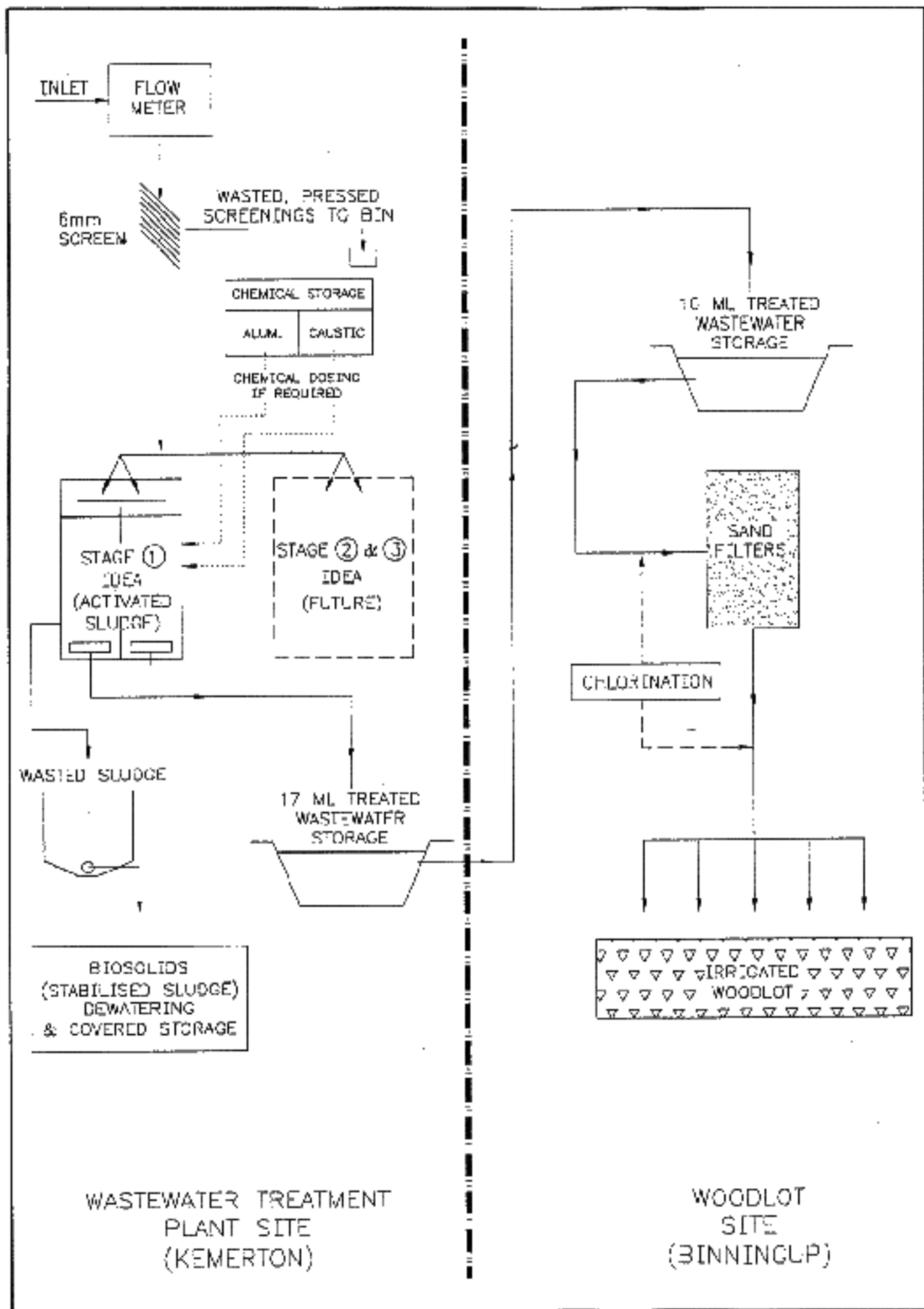


Figure 3. Wastewater treatment process at Kemerton and reuse at woodlot site.

A control building would be required at the wastewater treatment plant to house:

- The switchboards and controls for the treatment plant;
- A basic laboratory for process analysis and control; and
- Ablutions for the operations and maintenance staff.

A chemical storage area, consisting of three separately bunded areas would be required for aluminium sulphate, sodium hypochlorite and sodium hydroxide. The chemical storage areas would be complete with a safety drench shower and wash.

The aluminium sulphate, and possibly sodium hydroxide, would be required for the removal of phosphorus from the effluent. The sodium hypochlorite would be required for disinfection in the event of possible future reuse of the treated wastewater for purposes other than the proposed woodlot irrigation. One treated wastewater storage dam (17ML capacity) will initially be constructed for Stage 1.

### ***Biosolids management***

Biosolids (stabilised and dewatered organic sludge) from the Kemerton WWTP will be reused and/or disposed in accordance with National Guidelines for Biosolids Management. This is consistent with all other Water Corporation WWTPs (ARMCANZ and ANZECC, 2000).

Any on-site management of biosolids, sludges or organic material will be subject to DEP licence conditions under Part V of the *EP Act*.

### **2.3 Woodlot at Binningup**

The proposal is to initially establish a 60ha woodlot irrigation site at Binningup for wastewater reuse. A 10ML storage dam will also be constructed initially on the site.

## **3. Community consultation**

The proposal has been developed in conjunction with an extensive consultation process for the future of wastewater treatment and disposal in the Bunbury region. The various stages of the consultation process are briefly summarised below.

### ***Wastewater 2040***

Wastewater 2040 was a major consultative program, which formally commenced in October 1993. Information about wastewater was distributed via the media, issues papers and the June 1994 Discussion Paper. A series of workshops were held to assess options against agreed criteria. In July 1995 this process culminated in the release of the Wastewater 2040 Strategy for the South-West. In this document the Corporation gave a commitment to pursue land disposal and/or reuse where viable, a long term strategy widely supported by the community.

### ***The Greater Bunbury Study***

This 1997 study focused in more detail on land disposal/reuse options developed in Wastewater 2040. Essentially this phase of the project set out to find suitable sites to enable the preferred community option to be implemented. During and after this study feedback was sought from key stakeholder organisations.

### ***Preferred option selection and community announcement***

Following on from the Greater Bunbury Study, the Corporation consulted and liaised with the community regarding the proposal with the selection of the preferred option based on the irrigation of a E. Globulus plantation near Binningup (referred to as Site 6 in the Greater

Bunbury Study). Consultation and liaison with the community occurred in December 1998, and included:-

- the Minister for Water Resources;
- local Members of Parliament;
- Shire of Harvey;
- Shire of Dardanup;
- The community by way of media release.

There were no significant issues raised from this process.

### ***Proposal updates***

A number of updates have been provided to community representatives since detailed investigation of the preferred woodlot site commenced in early 1999. A public meeting was held with the Binningup Community Association on 18 April 2001.

The Corporation provided an update of the proposal at the Binningup Community Association meeting held on 18 April 2001. The meeting was well attended (16 excluding Corporation representatives). The main objective was to discuss and resolve any issues that could result in modifications to the proposal. The community reaction during the meeting was very positive, with most issues relating to the community's existing use of groundwater and their desire to secure reclaimed water at a low cost to irrigate recreation areas. All issues raised appeared to be satisfactorily addressed, including those relating to management of the proposal (such as odour, mosquitoes and groundwater level).

### ***Communication***

The Corporation plans to provide regular updates to interest groups in the region during the course of the project.

The environmental review documentation will be made readily available to interest groups.

## **4. Relevant environmental factors**

In the EPA's opinion the following are the environmental factors relevant to the proposal:

- 4.1 Surface and groundwater quality; and
- 4.2 Terrestrial vegetation and wetlands.

### **4.1 Surface and groundwater quality**

The key environmental factor is the protection of groundwater and surface water quality particularly in relation to Parkfield Drain and the Leschenault Inlet (Figure 4).

There are also other surface water bodies such as some enhanced and conservation category wetlands adjacent to the project sites particularly on the proposed pipeline route from Kemerton WWTP to the woodlot.

As the proposal covers three general locations: WWTP, the woodlot and the pipeline alignment, the potential impacts to groundwater and surface water were considered for each of these components.

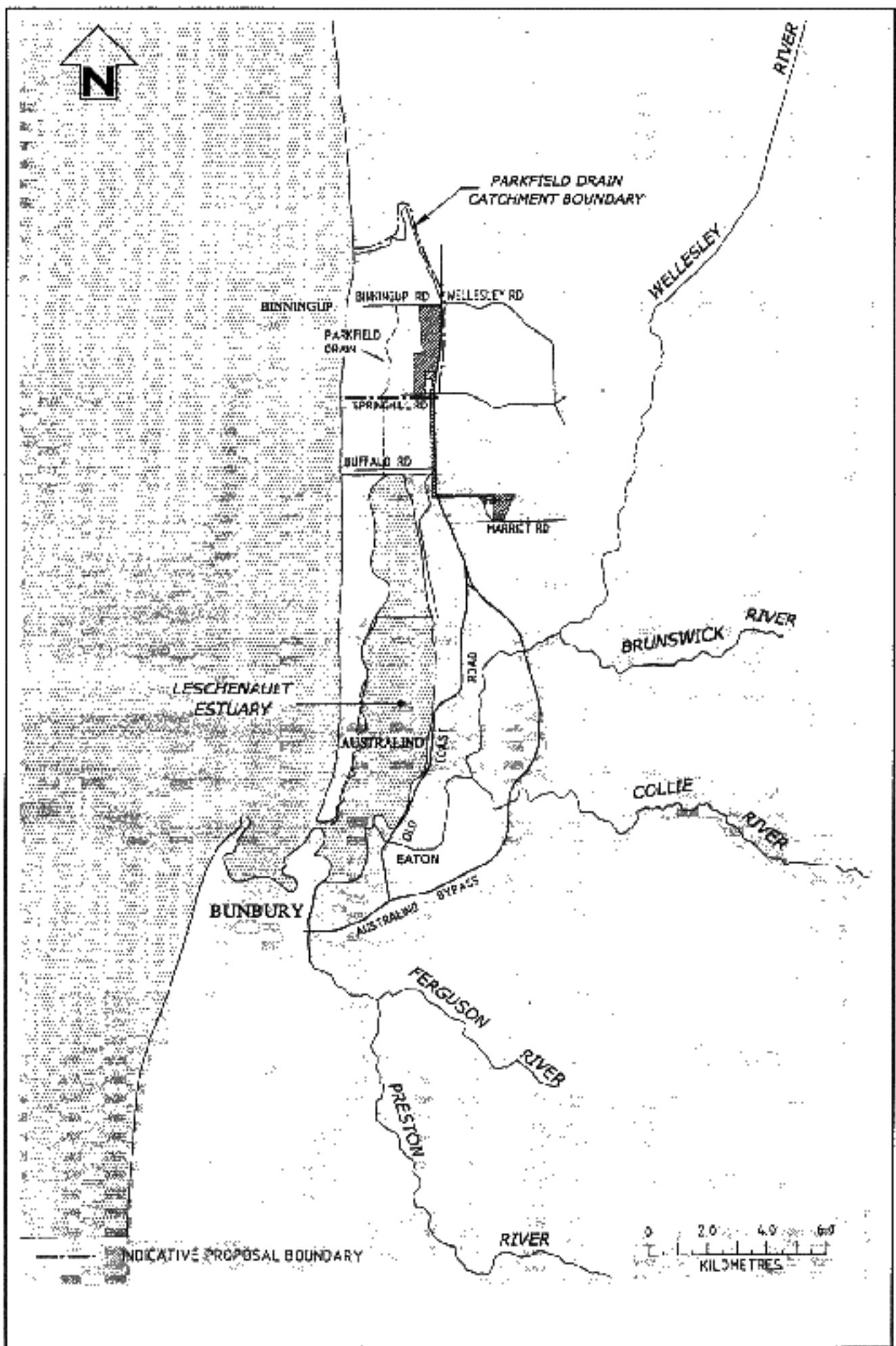


Figure 4. Major surface water drainage.

## ***WWTP Site***

The WWTP site is within the Wellesley River catchment approximately 7 km from the Wellesley River. The Wellesley Catchment is a significant source of nutrients, sediments and organic material to the lower Brunswick and Collie rivers and to the Leschenault Estuary.

Groundwater is approximately 18m below the surface. The risk of groundwater contamination, although unlikely, is from the storage facilities (sludge lagoons and treated wastewater storage). However this risk will be minimised as the storage facilities at the WWTP site will be lined to reduce leakage to groundwater.

To manage the potential risk of surface water contamination due to overtopping or failure of storage facilities at the WWTP, all storage sludge lagoons for biosolids and for the treated wastewater will be designed according to Australian Standards incorporating 0.5 m of freeboard for the sludge lagoons and treated wastewater storage to reduce the risk of overtopping.

Taking into account the proposed design of the storage facilities, the proponent's commitments and the management requirements of a Works Approval under Part V of the EP Act, it is the EPA's opinion that the proposal can be managed to achieve an environmentally acceptable outcome.

## ***Woodlot***

Groundwater at the woodlot site is between 4m and 10m below the surface, becoming shallower to the west. The Binningup town water supply bore is located adjacent to the northern extent of the woodlot site. The bore is screened in the Leederville Formation and it is not expected that groundwater will be affected by the woodlot (Rockwater, 2000).

Wetlands extending from the northern end of the Leschenault Estuary are located approximately 500m to the west of the proposed woodlot site. These wetlands extend past the proposed woodlot site to just beyond Binningup Road and are identified as 'Conservation' wetlands; Parkfield Drain is located within the wetlands north of the Leschenault Estuary. Runoff from the woodlot site due to over-irrigation and overtopping or failure of the treated wastewater storage is unlikely. The most likely effect on the water quality of Parkfield Drain would be due to groundwater flow into the drain carrying nutrients from groundwater below the woodlot and the adjacent horticultural land.

Wastewater irrigation at the woodlot will involve summer and winter irrigation. In winter, the irrigation rate will exceed evapotranspiration rates and therefore greater infiltration will occur. This will result in some leaching of nutrients (nitrogen and phosphorus) to groundwater in the northern part of the Leschenault catchment. It is predicted that approximately 2.5 tonnes per year of nitrogen could possibly reach groundwater. It is possible that some of the nutrients could find their way into the Leschenault Inlet via the Parkfield Drain. Water quality in Parkfield Drain is relatively poor. It is a significant source of nutrients to the Leschenault Estuary. However this load is small compared to the annual loading of approximately 35 tonnes per year of nitrogen currently discharging to groundwater from the Eaton and Australind WWTP's and the septic tanks within the Leschenault Inlet catchment. The diversion of sewage from estuary-side urban areas, and the decommissioning of the Eaton and Australind WWTPs will provide a significant benefit to the environment.

The extent of hydrological connection between the groundwater and the drain, and therefore the potential impacts of nutrients in the groundwater on the drain and Leschenault Inlet, is uncertain. It is possible that some groundwater may pass under the drain and towards the ocean. Therefore the best approach would be to carry out investigations and monitoring of groundwater beneath and downflow of the woodlot and adjacent horticulture to determine whether significant nutrients levels are likely to enter the drain.

The proponent has committed to carry out investigations and monitoring of groundwater. Monitoring bores will be installed in winter 2001. Groundwater monitoring and reporting will occur after the first and second winters of irrigation.

In addition, the proponent has committed to prepare and implement a Nutrient Irrigation and Management Plan (NIMP) to manage the irrigation regime. The NIMP will ensure that surface runoff of irrigation water does not occur and that the nutrient application rate meets the Water and Rivers Commission's guidelines for the protection of ground water quality (Water and Rivers Commission, 1998)

The proponent has committed to increase the area of wastewater irrigation from 60ha in subsequent years within the 3 year approval, if required and to provide a rain-fed tree buffer to the west of the irrigated woodlot. The proponent has also committed to investigate and implement mitigation strategies if it is shown that a groundwater plume from the woodlot is likely to enter the Parkfield Drain and cause an adverse effect, and alternative disposal options including:

- Groundwater recovery;
- Industrial reuse;
- Ocean discharge;
- Golf course in Binningup; and
- Wetland reinstatement.

The proponent has committed to provide additional storage capacity for development beyond three years to ensure that irrigation rates match evapo-transpiration, if an alternative acceptable long-term disposal and/or mitigation strategy cannot be demonstrated.

The EPA considers that taking into account the proponent's commitments, the woodlot irrigation is capable of being managed to achieve an environmentally acceptable outcome.

### ***Pipeline construction***

Impacts on surface water quality due to the pipeline would only occur as a result of pipeline failure. Treated wastewater may then discharge to the catchment of Parkfield drain. However, no impacts on surface water quality are likely to occur as the pipeline will be designed to Australian Standards to minimise the risk of pipeline failure.

The proponent has committed to prepare and implement an EMP for the routing and construction of the wastewater pipeline, pressure main and transfer pumping station.

## **4.2 Terrestrial vegetation and wetlands**

### ***Terrestrial vegetation***

#### ***WWTP***

The proposed site for the WWTP consists of a number of isolated jarrah and marri (*Eucalyptus marginata* and *Corymbia calophylla*- *Banksia attenuata* ) trees. The vegetation is generally in poor condition as much of it has been cleared for livestock grazing leaving only isolated mature trees. However, the north-eastern corner of the site contains native vegetation in excellent condition and is proposed for conservation. Its value would be enhanced if the area immediately east and a strip to the south could also be conserved to increase the area and connection.

Construction of the WWTP and associated facilities would result in the clearing of many of the isolated mature trees at the site (Figure 5). The proposal will have no impact on the area of well-preserved native vegetation in the north-eastern corner of the site.



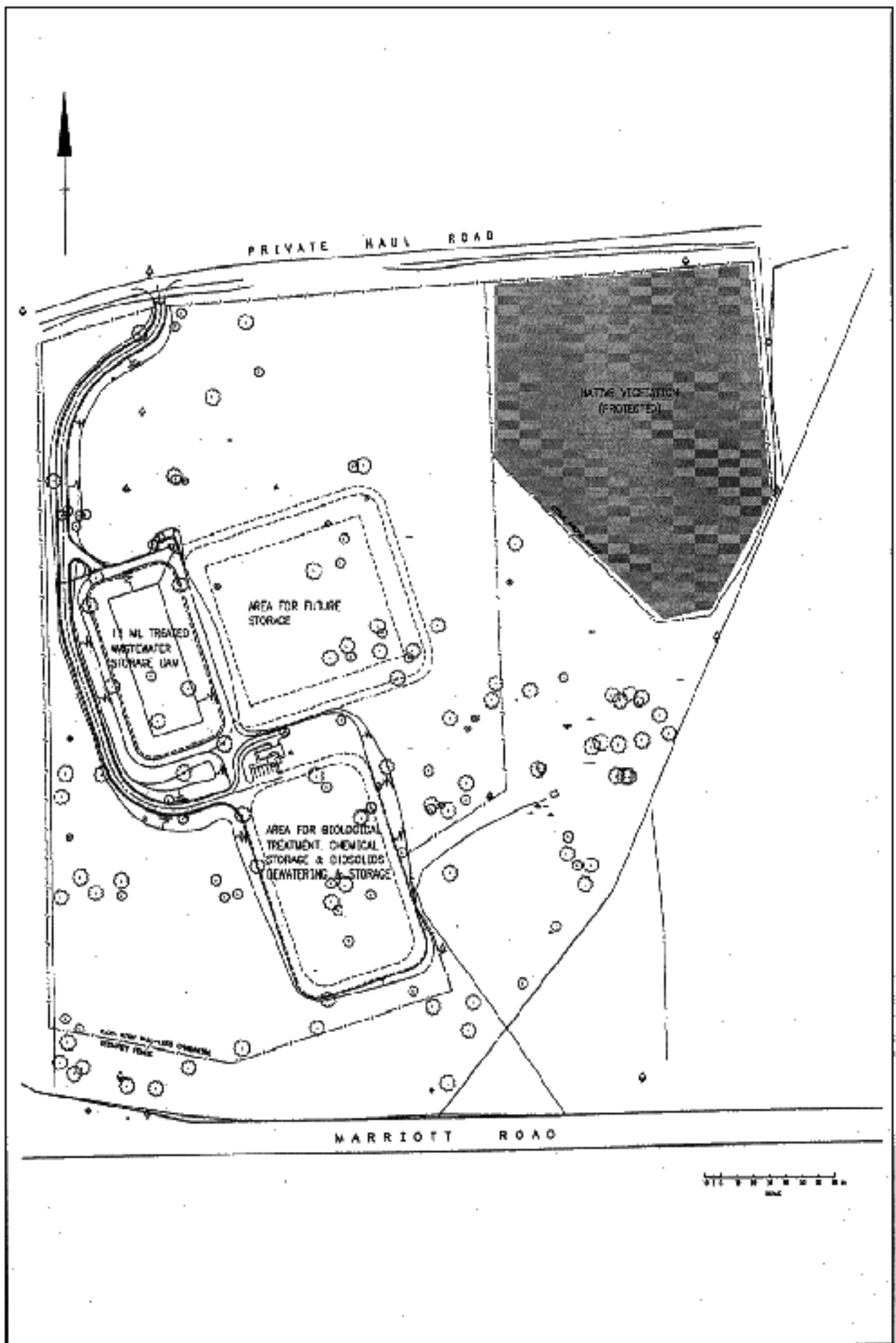


Figure 5. Plant layout showing vegetation on proposed Kemerton WWTP site.

The proponent has committed to erect an exclusion fence around the well-preserved vegetation in the north-eastern corner of the site prior to construction to prevent impact on the vegetation.

### ***Woodlot***

The proposed woodlot site (Figure 6) is characterised by an existing rain-fed Tasmanian blue gum (*Eucalyptus globulus*) plantation. The existing tree plantation would be harvested prior to the establishment of the irrigated woodlot. The establishment of the woodlot will not require the clearing of any remnant native vegetation.

### ***Wastewater pipeline routes***

The proposal will involve the construction of two pipelines to:

- redirect untreated wastewater from the two existing WWTPs to the new Kemerton WWTP; and
- convey treated wastewater from the Kemerton WWTP to the woodlot at Binningup.

The proponent has committed to prepare and implement an EMP for the routing and construction of the wastewater pipeline, prior to the construction of the Kemerton WWTP, to the satisfaction of the DEP on advice of the Water and Rivers Commission and the Department of Land and Conservation.

### ***Wetlands***

There are several wetlands in the area of the proposal, particularly along the Old Coast Road, (Figure 7) which are listed in the Environmental Protection (Swan Coastal Plain) Policy 1992 and/or are classified as “Conservation’ or ‘Resource Enhancement’ wetlands.

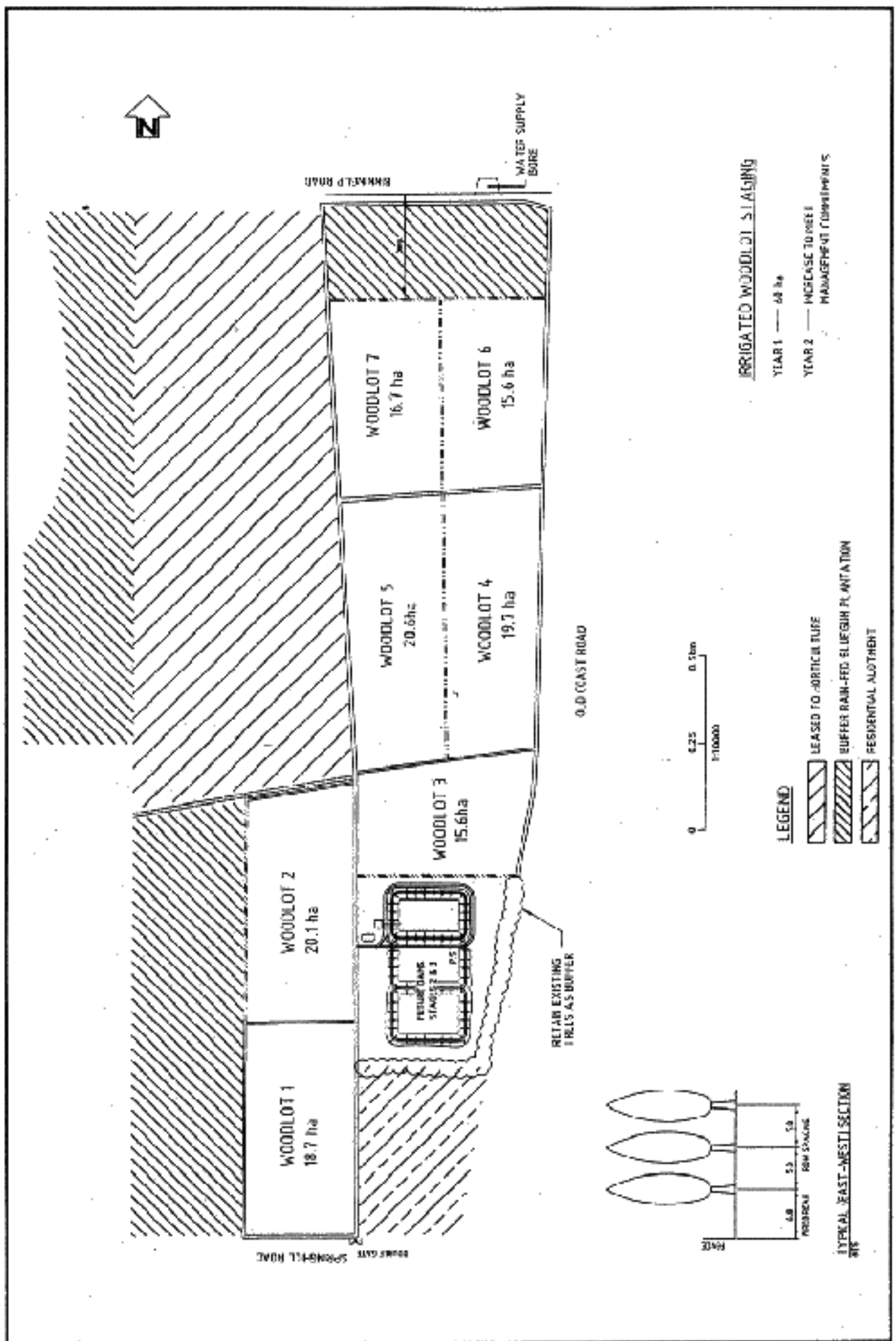
Details of the routing and construction of the wastewater pipelines from Eaton and Australind to the WWTP, and the pipeline from the WWTP to the Woodlot will be submitted to the Environmental Protection Authority as part of an EMP requirement before the construction of the WWTP.

## **5. Conclusions**

The EPA has concluded that the proposal for the establishment and operation of a wastewater treatment plant at Kemerton and a woodlot at Binningup for an initial three years is capable of being implemented in an environmentally acceptable manner provided there is satisfactory implementation by the proponent of its commitments.

Furthermore, the EPA is satisfied that there are suitable options available to ensure the project is managed in an environmentally acceptable manner on an on-going basis. These, however, need to be further investigated over the next three years to determine the most appropriate option in terms of environmental and social benefits, and costs.

The Water Corporation has committed to investigate options for longer term disposal of the treated wastewater and refer this to the EPA for consideration and approval such that any additional works required can be put in place beyond the three years covered by this approval.



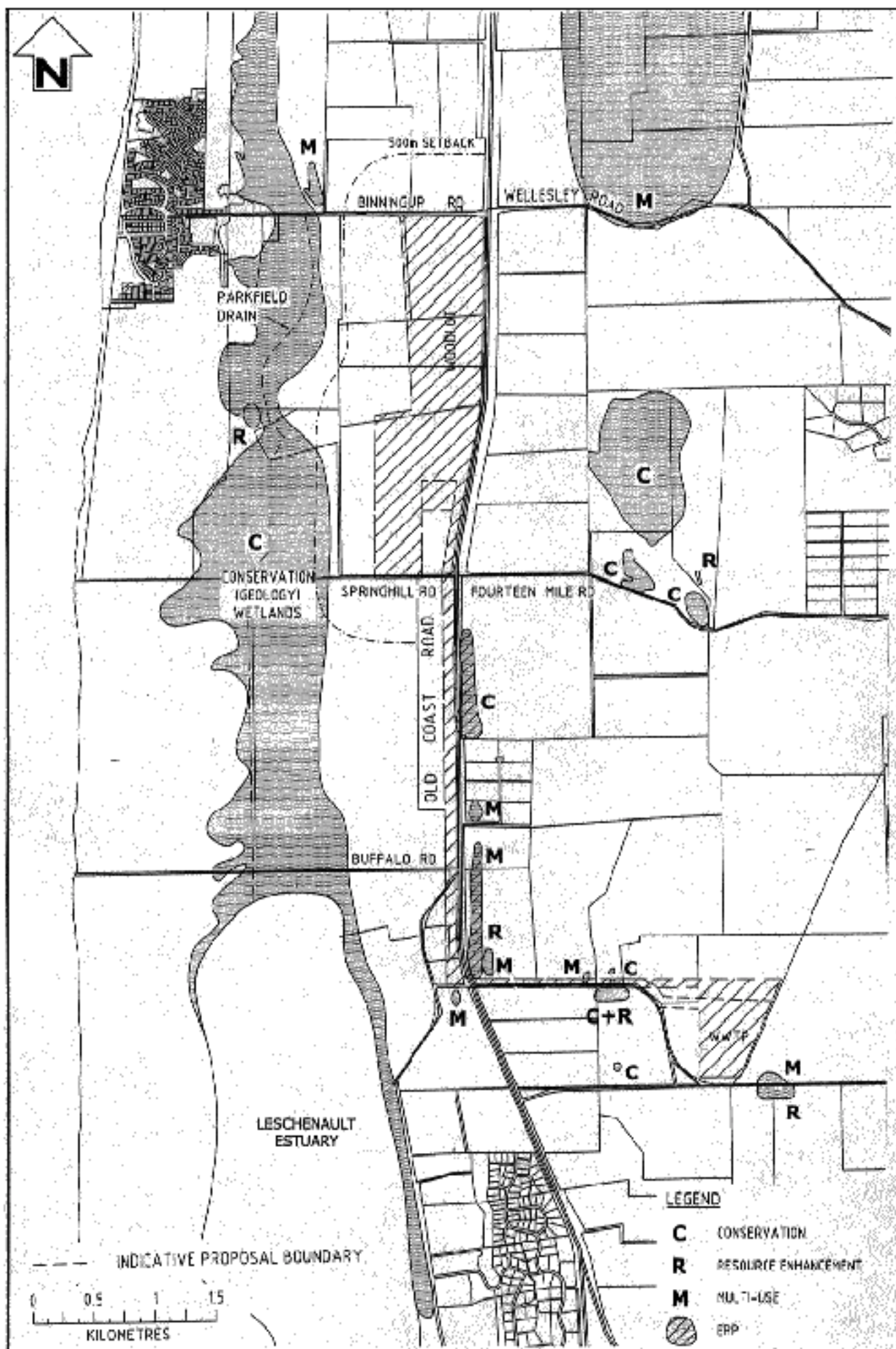


Figure 7. Wetlands in the vicinity of the proposal.

## 6. Recommendations

The EPA considers that the proponent has demonstrated in the EPS document “Kemerton Wastewater Treatment Plant and Treated Wastewater Reuse to Woodlot at Binningup”, by its commitments, that the proposal can be managed in an environmentally acceptable manner and provides the following recommendations to the Minister for the Environment:

- 1 That the Minister notes that this report follows a decision by the EPA to set a level of assessment as EPA-initiated Environmental Protection Statement because:
  - The proponent’s commitments in relation to the environment factors identified needed to be made legally binding through the environmental conditions set in accordance with Part IV of the *Environmental Protection Act 1986*.
  - The proposal is not of the magnitude to warrant full environmental impact assessment under Part IV of the *Environmental Protection Act 1986*.
- 2 That the Minister considers the report on the relevant environmental factors as set out in Section 4.
- 3 That the Minister notes that the EPA has concluded that it unlikely that the EPA’s objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions and proponent commitments as set out in Appendix 2.
- 4 That the Minister imposes the conditions recommended in Appendix 2 of the report.

## **Appendix 1**

### **References**

Brown and Root, 2001. *Australind – Eaton Wastewater Treatment Plant and Woodlot*. Notice of Referral, 21 March 2001.

Brown and Root, 2000. *Australind – Eaton Wastewater Treatment Plant and Woodlot*. Notice of Referral, 6 September 2000.

Kinhill, 2000. *Australind – Eaton Wastewater Treatment Plant and Woodlot* Definition Report, 15 June 2000.

National Health and Medical Research Council (NHMRC) and Australian and New Zealand Environment Conservation Council (ANZECC), 2000. *Draft Guidelines for Sewerage Systems Sludge (Biosolids) Management*. National Water Quality Management Strategy.

Rockwater, 2000. *Australind-Eaton Wastewater Study Modeling Groundwater Flows from Planned Woodlot*, February 2000.

Water and Rivers Commission (WRC) 1998. *Irrigating Vegetated Land with Nutrient-Rich Wastewater*. Water Quality Protection Note. Irrigation with nutrient-rich wastewater, March 1998.

Water Corporation, 2001. Letter to Department of Environmental Protection, Notice of Referral, 2 March 2001.

## **Appendix 2**

### **Recommended Environmental Conditions and Proponent's Consolidated Commitments**

#### **STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)**

#### **KEMERTON WASTEWATER TREATMENT PLANT AND TREATED WASTEWATER REUSE TO WOODLOT AT BINNINGUP**

**Proposal:** The proposal is to construct and operate a wastewater treatment plant at Kemerton, a pipeline, pressure main and woodlot at Binningup

**Proponent:** Water Corporation of Western Australia

**Proponent Address:** 629 Newcastle Street, Leederville, Western Australia 6007

**Assessment Number:** 1376

**Report of the Environmental Protection Authority:** Bulletin 1011

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

### **1 Implementation**

- 1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 of this statement.
- 1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.
- 1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

### **2 Proponent Commitments**

- 2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 2 of this statement.
- 2-2 The proponent shall implement subsequent environmental management commitments, which the proponent makes as part of the fulfillment of conditions and procedures in this statement.

### **3 Proponent**



- 3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.
- 3-2 Any request for the exercise of that power of the Minister referred to in condition 3-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.
- 3-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

#### **4 Commencement**

- 4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced.
- 4-2 Where the proposal has not been substantially commenced within five years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment and Heritage will determine any question as to whether the proposal has been substantially commenced.
- 4-3 The proponent shall make application to the Minister for the Environment and Heritage for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement at least six months prior to the expiration of the five year period referred to in conditions 4-1 and 4-2.
- 4-4 Where the proponent demonstrates to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

#### **5 Compliance Auditing**

- 5-1 The proponent shall submit periodic Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.
- 5-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal, written advice that the requirements have been met.
- 5-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment and Heritage.

#### **6 Environmental Management System**

- 6-1 In order to manage the environmental impacts of the project, and to fulfill the

requirements of the conditions and procedures in this statement, prior to the commencement of construction of the Wastewater Treatment Plant, pressure main, pipeline and the establishment of the Woodlot, the proponent shall demonstrate to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection that there is in place an environmental management system which includes the following elements:

- 1 An environmental policy and corporate commitment to it;
  - 2 Mechanisms and processes to ensure:
    - (1) planning to meet environmental requirements;
    - (2) implementation and operation of actions to meet environmental requirements;
    - (3) measurement and evaluation of environmental performance; and
  - 3 Review and improvement of environmental outcomes.
- 6-2 The proponent shall implement the environmental management system referred to in condition 6-1.

## Schedule 1

### The Proposal

The proposal being assessed is for the works and operation of a wastewater treatment plant and woodlot reuse scheme for the first three years. This will enable monitoring and evaluation to be undertaken to determine a longer term strategy for development and operation of the scheme. The works and operation for the first three years forms part of planned Stage 1 of the scheme, which will extend to the year 2010. A further two stages (extending to 2040) are planned for the future (Brown and Root, 2001).

The proposal (Figure 1) is to construct:

- An advanced activated sludge wastewater treatment plant at Kemerton's Stage 1 design capacity would be 3.6 ML/day;
- A 17 ML storage dam at the Kemerton wastewater treatment plant;
- A treated wastewater pumping station located at Kemerton;
- A 9.0 km pipeline to deliver wastewater from Eaton and Australind to Kemerton wastewater treatment plant;
- A 7.4 km pressure main to deliver reclaimed water to the woodlot site located near Binningup;
- A 10ML treated wastewater storage dam at the woodlot site; and
- A 60ha woodlot irrigation site at Binningup.

**Table 1: Summary of key proposal characteristic**

Item	Feature	Characteristic
Wastewater treatment plant	General description	Intermittently decanted extended aeration (IDEA) plant (or other equivalent plant) including at least two sludge lagoons and an on-site storage for treated wastewater.
	Location	Lot 26 Marriott Road, Kemerton
	Treatment capacity (Year 2010)	3.6 ML/d
	Projected flow (Year 2002)	2.0ML/d
	(Year 2003)	2.4ML/d
	(Year 2004)	2.8ML/d
	Inflow water quality	275 mg/L BOD (unfiltered) 300 mg/L SS 70 mg/L N 15 mg/L P
Treated water quality from WWTP (apart from commissioning)	20 mg/L BOD 20 mg/L SS 7.5 mg/L N (annual mean) 10 mg/L N (annual 75%-ile) 1.0 mg/L P (annual mean) 1.5 mg/L P (annual 75%-ile)	
On-site storage	17 ML	
Treated wastewater conveyance pipeline	Location	Northern side of the Sons of Gwalia haul road and Rosamel Road between the WWTP site and the Old Coast Road, then crossing to the western side of the Old Coast Road north to the woodlot site.  Design and pipeline alignment to be addressed in EMP and approved prior to construction of WWTP.
	Length (approximate)	7.4 km
	Size	225 mm diameter
	Flow rate (maximum for Stage 3)	71 L/s
Raw wastewater conveyance pipeline	Location	Pipeline from Australind WWTP to Kemerton WWTP. Design and pipeline alignment to be addressed in EMP and approved prior to construction of WWTP.
	Length (approximate)	9.0 km
Sewage pumping station facility Woodlot	Location	Kemerton
	General description	Irrigated Tasmanian blue gum ( <i>Eucalyptus globulus</i> ) plantation
	Location	Lot Nos D36882/3-5, D36635/2 South of Binningup Road and east of the Old Coast Road near Binningup.
	Area	Minimum 60 ha <b>Note:</b> see commitment 7 to increase area of woodlot in subsequent years.
	On-site storage	10 ML

**Proponent's Consolidated Environmental Management  
Commitments**

30 April 2001

**KEMERTON WASTEWATER TREATMENT PLANT AND  
TREATED WASTEWATER REUSE TO WOODLOT AT  
BINNINGUP**

Water Corporation of Western Australia

## CONSTRUCTION AND OPERATION OF KEMERTON WASTEWATER TREATMENT PLANT AND MANAGEMENT OF BINNINGUP WOODLOT

### Proponent's Consolidated Environmental management commitments

No	Topic	Action (what/ how/ where)	Objective/s (why)	Timing (when)	To requirements of (To whom)	Advice (from whom)	Evidence (of complying with commitment)
1	Vegetation	Erect an exclusion fence around the excellent quality native vegetation in the north-eastern corner of the WWTP site.	To ensure no inadvertent impacts on the vegetation during construction of the WWTP facilities.	Prior to construction.	Shire of Harvey	-	Fence erected.
2	Groundwater quality	Prepare a Nutrient and Irrigation Management Plan for the woodlot.	To maximise takeup of nutrients by the woodlot and to minimise nutrient concentrations in the groundwater under the woodlot.	Prior to irrigation of the woodlot with treated wastewater.	DEP	WRC	Plan submitted to DEP for approval.
3	Groundwater quality	Implement a Nutrient and Irrigation Management Plan for the woodlot.	To maximise takeup of nutrients by the woodlot and to minimise nutrient concentrations in the groundwater under the woodlot.	At commencement of irrigation of the woodlot with treated wastewater.	DEP	WRC	Plan implemented.
4	Groundwater quality	Design a groundwater monitoring program which includes the installation of groundwater monitoring bores.	To determine the quantity, transport and fate of nutrients leaching from the woodlot and adjacent horticulture.	At least 9 months prior to irrigation of the woodlot with treated wastewater.	DEP and LIMA	WRC	Program submitted to DEP for approval.
5	Groundwater quality	Implement a groundwater monitoring program which includes the installation of groundwater monitoring bores.	To determine the quantity, transport and fate of nutrients leaching from the woodlot and adjacent horticulture.	At least 6 months prior to irrigation of the woodlot with treated wastewater.	DEP and LIMA	WRC	Program implemented.

No	Topic	Action (what/ how/ where)	Objective/s (why)	Timing (when)	To requirements of (To whom)	Advice (from whom)	Evidence (of complying with commitment)
6	Groundwater quality	Maintain the rainfed (tree) buffer to the west of the irrigated woodlot.	To provide an additional barrier for the takeup of nutrients migrating from the irrigated woodlot towards Parkfield Drain.	Prior to commissioning of the facilities.	DEP	-	Rainfed buffer installed.
7	Groundwater quality	Increase area of irrigated trees from 60ha in subsequent years if excess treated wastewater cannot be redirected to higher value reuse applications.	To ensure that annual nitrogen application rates do not exceed 100kgN/ha. To ensure that annual water application rates do not exceed the growth requirements of the trees.	Within 26 months following approval of the proposal.	DEP	-	Additional irrigated trees planted.
8	Wastewater management	Report on options investigated and recommended mitigation strategy in the event that the monitoring program shows that a groundwater plume may enter Parkfield Drain and cause an adverse effect.	To ensure that additional infrastructure can be installed in time to prevent an adverse effect on Parkfield Drain and Leschenault Estuary.	Within 30 months following approval of proposal.	EPA	DEP WRC	Report submitted to EPA for approval.
9	Wastewater management	Implement mitigation strategy and appropriate option(s) if groundwater plume is likely to enter Parkfield Drain and cause an adverse effect.	To prevent an adverse effect on Parkfield Drain and Leschenault Estuary.	Within 54 months following approval of proposal.	EPA	-	Mitigation strategy implemented.
10	Wastewater management	Provide additional storage capacity if alternative options investigated under Commitment No.8 are not acceptable.	To provide a contingency to ensure that irrigation rates match evapotranspiration rates by summer of 2004/2005, if alternative options investigated are not acceptable.	Within 54 months following approval of proposal.	EPA	-	Additional storage commissioned.
11	Design of wastewater storage facilities	Line the treated wastewater storages and sludge lagoons with a synthetic or clay liner.	To prevent leakage of nutrient-enriched water to the groundwater table.	Prior to commissioning of the facilities.	DEP	-	Liner installed.
12	Construction	Prepare an EMP for the routing and construction of the wastewater pipelines from Eaton and Australind to Kemerton.	To ensure no inadvertent impacts on vegetation during construction of the pipeline.	Prior to construction.	DEP	WRC CALM	EMP submitted for approval.

<b>No</b>	<b>Topic</b>	<b>Action (what/ how/ where)</b>	<b>Objective/s (why)</b>	<b>Timing (when)</b>	<b>To requirements of (To whom)</b>	<b>Advice (from whom)</b>	<b>Evidence (of complying with commitment)</b>
13	Construction	Implement an EMP for the routing and construction of the wastewater pipelines from Eaton and Australind to Kemerton.	To ensure no inadvertent impacts on vegetation during construction of the pipeline.	During construction.	DEP	-	EMP implemented.
14	Construction	Prepare an EMP for the routing and construction of the wastewater pipeline from Kemerton to the woodlot at Binningup.	To ensure no inadvertent impacts on vegetation during construction of the pipeline.	Prior to construction.	DEP	-	EMP submitted for approval.
15	Construction	Implement an EMP for the routing and construction of the wastewater pipeline from Kemerton to the woodlot at Binningup.	To ensure no inadvertent impacts on vegetation during construction of the pipeline.	During construction.	DEP	-	EMP implemented.
16	Construction	Prepare an EMP for the construction of the Australind Transfer Pumping Station, which will convey wastewater from Australind to Kemerton.	To ensure no inadvertent impacts on vegetation during construction of the pump station.	Prior to construction.	DEP	-	EMP submitted for approval.
17	Construction	Implement an EMP for the construction of the Australind Transfer Pumping Station, which will convey wastewater from Australind to Kemerton.	To ensure no inadvertent impacts on vegetation during construction of the pump station.	During construction.	DEP	-	EMP implemented.
18	Visual	Plant a screen of trees and maintain existing trees between the woodlot dam embankment and the property boundary on Old Coast Road.	Minimise visual impact of the storage dam at the woodlot site (from Old Coast Road).	Prior to commissioning.	Shire of Harvey	-	Screen planted.
19	Aboriginal heritage	Conduct a detailed archaeological survey to determine if suspected artefact sites would be impacted by the proposal.	To prevent inadvertent impacts on recorded sites of cultural significance.	Prior to construction.	AAD	-	Survey approved and any necessary clearances obtained.



No	Topic	Action (what/ how/ where)	Objective/s (why)	Timing (when)	To requirements of (To whom)	Advice (from whom)	Evidence (of complying with commitment)
20	Potable water supply bore west of woodlot (pt Lot 4 on Diagram 24320)	Monitor quality of water supply and provide alternative supply if quality is adversely affected as a result of proposal.	No adverse impact on water supply as a result of proposal.	From commissioning	Health Dept	-	Monitoring results from water supply bore and up-gradient monitoring bores
21	Community consultation	Consult with community interest groups on proposal and its progress.	To inform, seek feedback and address community concerns about the project.	Prior to construction, and subsequently.	DEP	-	Record of consultation including issues raised and actions to address issues.

Abbreviations:

EPA: Environmental Protection Authority  
LIMA: Leschenault Inlet Management Authority  
DEP: Department of Environmental Protection  
AAD: Aboriginal Affairs Department  
WWTP: Wastewater Treatment Plant  
WRC: Waters & Rivers Commission  
EMP: Environmental Management Plan