

**Class IV Waste Disposal Cells, Red Hill Waste  
Disposal Facility, Toodyay Road, Red Hill,  
Shire of Swan**

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**Eastern Metropolitan Regional Council**

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

**Environmental Protection Authority  
Perth, Western Australia  
Bulletin 867  
October 1997**

ISBN. 0 7309 8053 7

ISSN. 1030 - 0120

Assessment No.1088

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## **Summary and recommendations**

The Eastern Metropolitan Regional Council (ERMC) proposes to establish Class IV waste disposal cells at its existing Red Hill Waste Disposal Facility. These waste cells would provide for the disposal of low hazard wastes, including contaminated soils and household hazardous wastes, within the Perth metropolitan area. The facility is located approximately 12 km north east of Midland on Toodyay Road, Red Hill. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the environmental factors, conditions and procedures relevant to the proposal.

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

### **Relevant environmental factors**

Although a number of environmental factors were considered by the EPA in the assessment, it is the EPA's opinion that the following are the environmental factors relevant to the proposal, which require detailed evaluation in the report:

- (a) surface water quality;
- (b) groundwater quality; and
- (c) buffer zone.

### **Conclusion**

The EPA notes the high integrity design of the proposed Class IV cells and the current high standard of site management, including surface and groundwater management, and has concluded that the proposal by the ERMC to establish Class IV waste disposal cells at its existing Red Hill Waste Disposal Facility can be managed to meet the EPA's objectives, provided that the conditions recommended in Section 4 and set out in formal detail in Appendix 4, are imposed.

The EPA believes that the proposal meets the community need for a Class IV waste disposal facility to provide a secure and more practical means for disposal of the large quantities of contaminated soils generated from the clean up of contaminated sites in the Perth metropolitan region, which otherwise could only be disposed of at the State Government owned Intractable Waste Disposal Facility at Mt Walton East, approximately 475 km north east of Perth.

### **Recommendations**

The EPA recommends that:

1. The Minister for the Environment considers the report on the relevant environmental factors of surface water quality (3.2), groundwater quality (3.3), and buffer zone (3.4);
2. The Minister for the Environment notes that the EPA has concluded that the proposal can be managed to meet the EPA's objectives, and thus not impose an unacceptable impact on the environment, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Section 4;
3. The Minister for the Environment imposes the conditions and procedures consistent with Section 4 and set out in formal detail in Appendix 4 of this report.

## **Conditions**

The EPA recommends that the following conditions, which are set out in formal detail in Appendix 4, be imposed if the proposal by the ERMCo to establish Class IV waste disposal cells at Red Hill is approved for implementation:

- (a) the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 4; and
- (b) in order to manage the relevant factors and EPA objectives contained in this bulletin, and subsequent conditions and procedures authorised by the Minister for the Environment, the proponent shall be required to prepare, prior to implementation of the proposal, environmental management system documentation with components such as those adopted in Australian Standards AS/NZ ISO 14000 series.

## 1. Introduction and background

The Eastern Metropolitan Regional Council (EMRC), the proponent, proposes to establish Class IV waste disposal cells at its existing Red Hill Waste Disposal Facility to provide for the disposal of low hazard wastes including contaminated soils and household hazardous wastes within the Perth metropolitan area. The facility is located approximately 12 km north east of Midland on Toodyay Road, Red Hill (Figure 1).

In Western Australia, landfill waste is divided into five classes, namely Class I to V (see Table 1, Appendix 1). The current standards for suitability of waste for disposal at a landfill facility are based on the maximum concentration of contaminants in the waste and the Toxicity Characteristic Leaching Procedure (TCLP) test (DEP, 1996a).

The Class IV waste materials are frequently contaminated soils generated from the clean up of contaminated sites, and on a smaller scale, wastes generated from domestic, commercial and manufacturing sources (such as pesticides, cleaning and paint products). The EMRC estimates that about 300,000 m<sup>3</sup> to 500,000 m<sup>3</sup> of contaminated soil would be available for disposal within two years. Following this amount, an annual quantity between 10,000 m<sup>3</sup> and 15,000 m<sup>3</sup> of Class IV waste is likely to be generated.

There is an increasing recognition by the community and government agencies of the need to establish a Class IV waste disposal site in close proximity to the Perth metropolitan region, to accommodate large quantities of low hazard waste that exceed Class III (putrescible) waste criteria. This matter was identified in the report of the Select Committee on Recycling and Waste Management which was tabled in Parliament in December 1995. The only approved site for Class IV (and Class V) material in WA is at the State Government owned Intractable Waste Disposal Facility at Mt Walton East, approximately 475 km north east of Perth.

The existing Red Hill Waste Disposal Facility has been in operation since 1981 and has had environmental approval for Class III waste disposal cells since 1991 following an EPA assessment (EPA Bulletin 569). It incorporates best practice technology and principles of sanitary landfill design and operation. The facility has a full leachate collection system, landfill gas extraction system/power station, groundwater drainage system to prevent water from entering the in-situ waste, and a surface water runoff control system (silt traps, compensation basins and nutrient stripping ponds). The Department of Environmental Protection's (DEP's) 1996 audit report stated that "Red Hill has adopted many environmentally aware practices and is considered a benchmark for all other landfill sites throughout the state".

Further details of the proposal are presented in Section 2 of this Report. Section 3 discusses environmental factors relevant to the proposal. Conditions and procedures to which the proposal should be subject if the Minister determines that it may be implemented are set out in Section 4. Section 5 presents the EPA's conclusion and Section 6 the EPA's recommendations.

Appendix 1 provides figures and tables relating to the proposal. A list of people and organisations that made submissions is included in Appendix 2. References are listed in Appendix 3, and recommended conditions and procedures and proponent's commitments are provided in Appendix 4.

The DEP's summary of submissions and the proponent's response to those submissions has been published separately and is available in conjunction with this report.

## 2. The proposal

The proposed Class IV waste site is located at the south east corner of the Red Hill Waste Disposal Facility (Figure 2). The site is a rectangular area of approximately 9.6 hectares with dimensions of 480 m by 200 m.

The DEP's design and construction criteria (DEP, 1996b) for proposed Class IV landfills follow the USEPA Minimum Technology Guidance for Hazardous Waste Landfills (USEPA, 1987 and 1989). The principal design features recommended for lining and capping are shown in Figure 3. The Class IV waste cells will be designed to meet the DEP's guidelines which require both primary and secondary leachate collection and removal systems, each underlain by liners. The results of geological and hydrological investigations carried out by the proponent (EMRC, 1997, Sections 2.2 to 2.7) have identified that the Class IV waste site and the facility meet all the site selection criteria stipulated by the DEP for Class IV waste disposal.

The concept design proposed for Class IV cells is illustrated in Figures 2 and 4. On the basis of cost optimisation, geology and hydrogeology of the site, the option of three cells, each of plan area 160m x 200m, was selected from a number of cell layout options, with Cell 1 to be developed first (Figure 2). The primary leachate collection system collects leachate from the cells via Megaflo drainage pipes into a sump. The secondary or leakage detection system consists of a drainage net sandwiched between two HDPE liners located below the primary leachate collection system. Leachate is collected in slotted and unslotted HDPE pipes and discharged into a well adjacent to, but separate from the primary leachate collection system sump. All leachate collected from the cells will be discharged into a HDPE lined evaporation pond with leak detection system identical to the cell liner. The preliminary design of the base and wall liners and capping is based on seepage analyses and liner evaluation (GHD, 1997). The proposed base liner system is identical to that approved for Kwinana Power Station ash disposal ponds.

Prior to disposal to landfill, waste must be assessed against the DEP's waste classification criteria (DEP, 1996a) to determine the Class of waste. This is a requirement under the DEP's operating Licence that will control activities on the site. The current standards for assessment of waste suitable for disposal at a landfill are based on the maximum concentration of contaminants in contaminated soils and the Toxicity Characteristic Leaching Procedure (TCLP) test. Analysis of contaminated material is undertaken by a National Association of Testing Authorities (NATA) approved laboratory, which is required to follow strict analytical procedures applicable to specific chemical parameters. These waste acceptance procedures are presently in place at the Red Hill facility for Class III material and would be extended to cover Class IV material.

All Class IV waste will be kept covered during transport and up until the truck reaches the designated disposal area inside the containment cell.

Initially the Class IV cells will be operated only in the dry months of the year. This will limit leachate generation considerably during the period that a nominal waste soil "cover" is established on the floor of the entire cell. It is anticipated that once a cover of 1.5 m has been placed then intermediate capping of the waste during the first winter will effectively limit or significantly reduce leachate generation thereafter.

Following the landfilling of Class IV material to just below the final landform level, the cell will be capped with a 500 mm compacted clay layer with a geofabric liner and a HDPE liner above it to ensure the integrity of the cell, prior to final landscaping and revegetation of the cell. Design of the capping is to provide for a dry entombment system such that the infiltration of stormwater will be minimal and not anticipated to generate leachate of sufficient volume to require ongoing management.

Although the final design details for the Class IV waste site have not been determined, a more detailed description of the proposal is provided in Section 3 of the CER document (EMRC, 1997). The DEP will assess the final design during the Works Approval process. The main aspects of the proposal are summarised in Table 1 below.



**Table 1: Summary of proposal aspects**

<b>Proposal Aspect</b>	<b>Description</b>
Class IV waste disposal cells	Three cells, each of plan area 160m x 200m, designed to provide a total containment capacity of 750,000m <sup>3</sup> , with provision for leachate removal systems. Stormwater runoff on the active cell can be managed for a 1 in 100 year storm event by closing off the leachate return system and evaporating the runoff on the cell itself.
Leachate evaporation pond	A HDPE lined evaporation pond located 100m from southern boundary of the site, designed to hold runoff from its own area for a 1 in 100 year storm event plus leachate collected from a sub-cell for a 1 in 20 storm event.
Groundwater drainage system	Subsoil drains underneath the cells to intercept natural groundwater and re-direct water away from the cell into siltation ponds.
Stormwater drainage system	Open V-drains to divert stormwater runoff away from active cells into silt traps prior to discharge to the environment
Cells decommissioning	Prior to revegetation, cells are capped with a compacted clay layer with a liner above it, and final landform contours will provide natural runoff to prevent any hydraulic head on the liner.

The potential impacts of the proposal initially predicted by the proponent in the CER document (EMRC, 1997) and their proposed management are summarised in Table 2 (Appendix 1).

### **3. Environmental factors**

#### **3.1 Relevant environmental factors**

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

It is the EPA's opinion that the following are the environmental factors relevant to the proposal, which require detailed evaluation in this report:

- (a) surface water quality;
- (b) groundwater quality; and
- (c) buffer zone.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors (preliminary factors) generated from the CER document and the submissions received, in conjunction with the proposal characteristics (including significance of the potential impacts), the adequacy of the proponent's response and commitments, and the effectiveness of current management. On this basis, the EPA considers that the terrestrial vegetation (including dieback management), dust, noise and odour factors and other issues raised in the submissions do not require further evaluation by the EPA. The identification process is summarised in Table 2.

The relevant environmental factors are discussed in Sections 3.2 to 3.4 of this report.

**CLASS IV WASTE DISPOSAL CELLS AT REDHILL WASTE DISPOSAL FACILITY - EASTERN METROPOLITAN REGIONAL COUNCIL**

**Table 2: Identification of Relevant Environmental Factors**

PRELIMINARY FACTOR	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT ENVIRONMENTAL FACTORS
<b>BIOPHYSICAL</b>			
<b>Terrestrial vegetation</b>	<p>Past landuse activities have resulted in the site being infected with dieback disease.</p> <p>There are no declared rare flora or priority listed flora recorded on the site.</p> <p>Establishing Class IV cells will result in vegetation removal and subsequent rehabilitation.</p>	No comment received from government agencies or the public.	<p>Proponent is committed to:</p> <ul style="list-style-type: none"> <li>• maintain species diversity in rehabilitated landfill cells and establish a sustainable vegetation cover; and</li> <li>• implement strategies pertaining to the Dieback Policy to ensure dieback is not spread to the surrounding forest.</li> </ul> <p>On-going management has been satisfactory.</p> <p><b>Factor does not require EPA evaluation.</b></p>
<b>POLLUTION</b>			
<b>Surface Water Quality</b>	<p>There are no defined watercourses on the site.</p> <p>The Class IV cells will initially only be operated during dry weather conditions.</p> <p>All surface water generated will be directed toward silt traps and the main siltation ponds for treatment prior to any disposal of stormwater off-site.</p> <p>Surface water will be monitored at three monthly intervals.</p>	<p><b>Government:</b> The WRC states that the parameters monitored for surface water discharges should reflect the parameters determined to be in the deposited waste. Monitoring cycles should include monitoring at the onset (desirably immediately prior) to overflow of storage impoundments, at the end of the wet season near cessation of overflow &amp; where induced by any summer season substantial storm events.</p>	<b>Considered to be a relevant factor.</b>
<b>Groundwater Quality</b>	<p>The location and extent of groundwater under the site is extremely variable due to the sites high location in the catchment and the lack of any defined groundwater aquifer.</p> <p>Class IV cells will be lined and fitted with leakage detection systems. The Class IV leachate pond will also be lined.</p> <p>Groundwater will be monitored at 3 monthly intervals.</p>	<p><b>Government:</b> The Water and Rivers Commission (WRC) states that the silt periodically reclaimed from the holding/evaporative basins associated with containment cell water management facilities should be deposited in the containment cells.</p> <p>The WRC states that any wash down facilities to clean trucks should have the wash waters isolated from the local environment and returned to the leachate management system.</p> <p><b>Public:</b> The Conservation Council of WA (CCWA) state that there needs to be an area for cleaning and washing trucks before they leave the site. This area should have procedures in place for the collection and treatment of contaminated water.</p> <p>The CCWA notes that the establishment of Class IV cells has the potential to increase the levels of pollutants in groundwater down gradient of the proposed leachate ponds. The Consultative Environmental Review (CER) states that in the event of groundwater contamination levels exceeding water quality guidelines, follow up monitoring would be undertaken to ascertain the influence of seasonal factors against longer term pollution trends. The CER does not state what happens if the groundwater monitoring programme detects a possible failure of the leachate containment system. There needs to be a strategy for resampling and a groundwater contamination remediation plan. The procedures to deal with such an event need to be clearly established.</p>	<b>Considered to be a relevant factor.</b>
<b>Buffer zone</b>	The Redhill facility presently sterilises a portion of the land to the South. The storage of Class IV waste will not increase the buffer requirement.	<p><b>Public:</b> Planning consultants representing the land owners to the south of the Red Hill Landfill facility note that a portion of their client's land is already sterilised from use as a result of buffer implications imposed by the Red Hill Landfill facility. Their client wants confirmation that the proposal will not result in the current buffer requirements being increased either now or in the future and furthermore seeks assurances that the future homesites will not be affected in any way by the activities undertaken in the Red Hill Site.</p> <p>The client believes that a more significant internal buffer should be imposed on the Red Hill facility in order to minimise the potential for impact upon the approved future residential development.</p>	<b>Considered to be a relevant factor.</b>

<p><b>Odour</b></p>	<p>Class IV wastes are likely to be mainly contaminated soils and are expected to be less odorous than Class III wastes.</p> <p>Cells will be covered and compacted daily to ensure odours are kept to a minimum.</p>	<p><b>Public:</b> Planning consultants representing a developer expressed concern that the buffer for the waste disposal facility fell on their client's land.</p>	<p>Proponent is committed to apply the current odour suppression strategy pertaining to Class III waste to Class IV waste.</p> <p>On-going management has been satisfactory.</p> <p>Factor can be managed under Part V of the <i>Environmental Protection Act</i>.</p> <p><b>Factor does not require EPA evaluation.</b></p>
<p><b>Dust</b></p>	<p>Road surfaces to Class IV cells will be sealed.</p> <p>Water tankers are used to suppress dust on any unsealed roads.</p> <p>All vehicles transporting Class IV waste will be covered.</p>	<p><b>Public:</b> The CCWA notes that the CER states that any dust impacts are kept to a minimum at present as access roads to existing cells are sealed. It states that unsealed roads through the site are kept moist using water trucks. The CCWA believes there should be no unsealed roads in such a facility.</p> <p>The CCWA notes that all contaminated materials will be kept covered during transport and until the loaded truck reaches the containment cell. There is no mention of dust gauges or additional dust suppression measures for windy conditions or the prohibition of dumping into waste cells during such conditions.</p> <p>Planning consultants representing an adjacent landowner expressed concern over the effect of dust on their client's property.</p>	<p>Proponent is committed to:</p> <ul style="list-style-type: none"> <li>• continue to implement dust suppression strategy in accordance with the DEP Dust Control Guidelines; and</li> <li>• establish high volume dust sampling programme.</li> </ul> <p>On-going management has been satisfactory.</p> <p>Factor can be managed under Part V of the <i>Environmental Protection Act</i>.</p> <p><b>Factor does not require EPA evaluation.</b></p>
<p><b>Noise</b></p>	<p>Site operations conducted between 0700 and 1600 hours, 7 days per week.</p> <p>No noise complaints received over the last 4 years.</p> <p>Road Transport: there will be an increase of approximately 8-16 truck movements per day.</p>	<p><b>Public:</b> Planning consultants representing an adjacent landowner expressed concern over the effect noise could have on their client's property.</p>	<p>Proponent is committed to maintain noise emissions within existing and proposed regulations.</p> <p>On-going management has been satisfactory.</p> <p>Factor can be managed under Part V of the <i>Environmental Protection Act</i>.</p> <p><b>Factor does not require EPA evaluation.</b></p>
<p><b>SOCIAL SURROUNDS</b></p>			
<p><b>Transport</b></p>	<p>Availability of Class IV cells could potentially result in an increase of up to 200 truck movements per day during 6 months of each of the first two years dropping to an increase of approximately 8-16 truck movements per day thereafter.</p> <p>Site operations conducted between 0700 and 1600 hours, 7 days per week.</p>	<p>No comment received from government agencies or the public.</p>	<p>This factor can be addressed when individual contaminated site clean up proposals are referred to the EPA.</p> <p><b>Factor does not require EPA evaluation.</b></p>
<p><b>OTHER ISSUES</b></p>			
<p><b>Other Issues raised in submissions</b></p>		<p><b>Public:</b></p> <p>The CCWA notes that the EMRC is seeking to construct cells to accept 500,000 m<sup>3</sup> of Class IV material. The document states that this will require the construction of 3-5 individual cells to meet current demand (section 1.3 of the CER). However we are also informed that Tonkin Park alone contains approximately 300,000 m<sup>3</sup>, added to the Omex waste and the Midland Railway Workshops, the site will now also be used for Minim Cove waste. It seems that there will be a need for more space at a much earlier date than anticipated.</p> <p>The CCWA believe that it is important that the management of the site demonstrate a willingness to negotiate lower charges for large volumes of low level hazardous waste to discourage dumping and other environmentally unacceptable solutions to site contamination. Perhaps there could be alternative payment schemes - either a large one-off payment, or a smaller initial payment with an ongoing storage charge.</p> <p>The CCWA states that the education of staff to deal with the new type of waste material is important. The level and nature of staffing and training should be adequate for environmentally responsible and safe management of the landfill.</p> <p>The CCWA notes that at present monitoring information is provided as a matter of course to the Waste Management Division, the Waterways Commission and the Gidgegannup Progress Association. Once this site is approved for the storage of Class IV waste, it is important that the information is more widely available to the general community.</p>	<p>There is no obligation on the proponent to provide sufficient capacity to service the needs of Perth, nor is the proponent obligated to provide discount pricing.</p> <p>The proponent has advised that staff training will be undertaken.</p> <p>Proponent is committed to:</p> <ul style="list-style-type: none"> <li>• address any concerns raised by the community; and</li> <li>• provide public access to EMRC meeting minutes, invitations to "Open Days" and community involvement in EMS.</li> </ul> <p><b>Factors do not require EPA evaluation.</b></p>

## 3.2 Surface water quality

### Description

The facility is positioned at the headwaters of the Susannah, Strelly and Jane Brook catchments (Figure 5) which discharge westward toward the Swan Coastal Plain and eventually into the Swan River. However, natural surface runoff is generally intermittent and restricted to areas outside the site during the winter months. The site itself does not contain any defined watercourses, and the flow of sporadic springs within the site is low and often ceases for the greater part of the year.

All surface water generated at the site is directed toward silt traps and two siltation ponds prior to any disposal. Off-site discharges only occur when pond storage capacity is exceeded, generally during the winter and spring period. Strelly Brook receives stormwater outflows from the main northern siltation pond for about 6 months of the year (May to November), Jane Brook receives outflows from the smaller southern siltation pond during significant storm events. A recently constructed nutrient and pollutant stripping pond adjacent to the northern siltation pond provides additional treatment for surface water prior to its discharge to the Strelly Brook catchment. The Susannah Brook does not receive any runoff from the site.

The siltation ponds and the receiving watercourses are monitored at three monthly intervals, with comprehensive monitoring every two years. Water quality parameters are in accordance with the DEP's recommendation and include pH, Total Dissolved Solids (TDS), nutrients and heavy metals. The proponent has developed water quality criteria for surface water discharged off-site during the winter period (Table 3, Appendix 1) based on the values recommended in the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993). Surface water monitoring data collected over the last 13 years are within these criteria and show no indication of any adverse impacts on down stream water quality. Reports on the monitoring are submitted to the DEP, Water and Rivers Commission and Gidgegannup Progress Association.

The environmental objective for surface water for this proposal is to ensure that water allowed to discharge off-site will remain within the current water quality criteria developed for the facility, in order to protect the fresh water ecosystem. Storm water would be diverted around the Class IV cells. It is proposed to extend the existing surface water monitoring programme to include the proposed siltation pond servicing the Class IV cells.

The leachate evaporation pond for the Class IV cells has been designed to hold runoff from its own area caused by precipitation in excess of 1 in 100 year storm event, and additional volume to hold one half of the runoff created by a 1 in 20 year storm event on an almost empty operating sub-cell (by splitting each cell into two sub-cells divided by a bund wall, where the extent of ponding in one sub-cell will not interfere with operations in the other sub-cell).

Initially the Class IV cells will be operated only in the dry months of the year. This will limit leachate generation considerably during the period that a nominal waste soil "cover" is established on the floor of the entire cell. It is anticipated that once a cover of 1.5 m has been placed then intermediate capping of the waste during the first winter will effectively limit or significantly reduce leachate generation thereafter.

### Assessment

The area considered for assessment is the Susannah, Strelly and Jane Brook catchments.

The EPA's objective in regard to this environmental factor is to maintain or improve the quality of surface water in accordance with the requirements of the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993)

The Water and Rivers Commission has advised that they are satisfied with the proposed design and operation of the Class IV cells, the leachate collection pond and the proposed surface water management. However, the Commission has also advised that the monitoring parameters for

surface water discharges should reflect the parameters in the deposited waste, and in response to this advice, the proponent has made a commitment to consult with the DEP on sampling parameters and criteria for surface water monitoring.

The Waste Management Division of the DEP has confirmed that management of surface water at the facility has been satisfactory to date, on the basis of site inspections and the monitoring results.

The EPA notes that the proposed environmental management objective for surface water is consistent with the EPA's objective.

Having particular regard to the:

- (a) current management of surface water at the facility;
- (b) the results of the surface water monitoring to date;
- (c) the proposed surface water collection system and extension of the current monitoring programme to include the Class IV cell operation;
- (d) the proponent's commitments to achieve its management objective for surface water and to develop monitoring parameters for Class IV waste in conjunction with the DEP; and
- (e) criteria in the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993),

it is the EPA's opinion that the proposal can meet the EPA's objective for surface water quality.

### **3.3 Groundwater quality**

#### **Description**

The location and extent of groundwater under the facility is extremely variable, due to the site's high location in the catchment and the lack of any defined groundwater aquifer. The two prevalent water tables at the site are a perched water table in the upper or ferruginous zone above a relatively impermeable layer of kaolinitic clays, and the lower or true groundwater table in the saprolitic zone. Groundwater in the lower zone is largely protected from pollution by the overlying layer of low permeability kaolinite.

Groundwater monitoring is undertaken through bores located immediately down gradient of the leachate ponds and around the perimeter of the site. A recently constructed bore has been positioned to gather baseline groundwater data immediately upstream of the proposed Class IV cells.

Frequency and parameters for groundwater monitoring will be determined in consultation with the DEP and based on the chemical characteristics of the contaminants in the material deposited in the Class IV cells.

Results of groundwater monitoring are compared against baseline data and water quality values recommended in the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993). Where exceedance of water quality criteria occur, follow-up monitoring is undertaken to ascertain the influence of seasonal factors against longer term pollution trends. In most cases, elevated levels in groundwater are due to seasonal occurrences. Reports on the monitoring are also submitted to the DEP, Water and Rivers Commission and Gidjegannup Progress Association.

Although the establishment of Class IV cells would increase the potential to pollute the groundwater down gradient of the proposed leachate pond, the design of the leachate recovery systems (primary leachate collection, leakage detection systems and the leachate/evaporation pond with liner and a leak detection system) will provide additional groundwater protection.

Concerns were expressed in public submissions about the lack of procedures for follow-up monitoring and remedial action in the event that the monitoring detected a possible failure of the

leachate containment system. The submissions also noted that there was no mention of a separate wash-down facility for trucks delivering Class IV material and suggested that a wash-down facility which isolated and drained the wash waters to the leachate containment system was needed. In response to these concerns, the proponent has made commitments to establish the additional procedures and a wash-down facility.

### **Assessment**

The area considered for assessment of this environmental factor is the site area and superficial aquifer down hydraulic gradient from the Class IV cells and leachate pond, within the site boundary.

The EPA's objective in regard to this factor is to maintain the quality of groundwater in accordance with the requirements of the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993).

The EPA understands that the DEP's design and construction criteria represent best practice technology for a Class IV waste disposal site, which provides a high level of groundwater protection.

The Waste Management Division (WMD) of the DEP advised that the proposed design for Class IV waste cells conforms with the DEP's guidelines (DEP, 1996b) which require both primary and secondary leachate collection and removal systems, each underlain by liners. The final details will be subject to further investigation and approval by the DEP. The Division also advised that results of groundwater monitoring at the facility has been satisfactory to date, and the site's management with respect to groundwater protection has been of a high standard. The identification of parameters for groundwater monitoring will be determined on the basis of the characteristics of wastes deposited in the cells as a requirement of the DEP operating licence.

The proponent has made a commitment to prepare a contingency plan detailing remedial action if groundwater contamination is detected. The proponent has made a commitment to provide separate wash-down facilities for trucks delivering to the Class IV cells. The washwaters will be collected and drained to the leachate containment system.

Having particular regard to the:

- (a) high integrity of the proposed design for the Class IV cells;
- (b) current management of groundwater at the facility;
- (c) relatively impermeable kaolinitic clays beneath the site; and
- (d) proponent's commitments relating to groundwater monitoring and wash-down facility for trucks delivering to Class IV cells,

it is the EPA's opinion that the EPA's objective is unlikely to be compromised and can be managed through the proponent's commitments and Part V of the Environmental Protection Act.

## **3.4 Buffer zone**

### **Description**

The purpose of a buffer zone is to reduce the impact of a landfill operation on neighbouring residences and other sensitive land uses, and to provide landfill operators with clear guidance and confidence for landfill planning. As a general principle, landfill operators are encouraged to fill areas on the boundary of the landfill site first and then work to the centre of the site, and the area of the site closest to the most sensitive land use should be filled first.

The Criteria for Landfill Management (HDWA, 1993) requires the Red Hill facility (and all other landfills) to maintain an internal buffer distance of 50 m (located within the landfill boundary), a primary buffer distance of 150 m from the active face (within which no residential

dwelling should be located), and a secondary buffer distance of 500 m from the active face (within which no subdivision should be allowed, with the exception of rural subdivisions where residences can be placed outside the 500 m zone). These external buffer distances are determined largely on the basis of odour from putrescible wastes. Following satisfactory decommissioning and rehabilitation of the cells, the external buffers would no longer be required.

The Red Hill facility is located on the south east boundary of the Shire of Swan and its southern perimeter borders John Forrest National Park and the proposed Temarup Estate situated within the Shire of Mundaring (Figure 6). The facility and surrounding land within the Shire of Swan is zoned Resources but the Temarup Estate is zoned Special Purpose (Tourism/Residential). Currently, the Red Hill facility complies with the above buffer requirement, and the proposed location of the Class IV cells is about 1,200 m to the nearest residence.

Planning consultants representing the land owners to the south of the facility (proposed Temarup Estate) raised concerns about the possibility of the current buffer zone being increased as a result of increased impacts from the activities of Class IV waste disposal, since a portion of their client's land has already been "sterilised" from use by the current buffer zone requirement for the facility.

### **Assessment**

The area considered for assessment of this environmental factor is the waste disposal site area and properties adjacent to the site boundary.

The EPA's environmental objective in regard to this factor is to protect the amenity of nearby residents from emissions of odour, dust and noise associated with activities from the site.

The Waste Management Division of the DEP advised that the design and characteristics of the Class IV cells and the nature of the waste they will receive (primarily contaminated soils and industrial sludges) mean that impacts from odour associated with the Class IV site will be reduced when compared with Class II or III sites receiving putrescible waste. Although the buffer zone for a Class IV cell could be reduced on this basis, the Division recommends that the current 500 m buffer zone required for Class III cells also apply to the Class IV cells.

The EPA supports the above advice and considers that, for the proposal, it is necessary to maintain the current requirement for buffer zones both within and outside the boundary of the facility, to ensure an adequate level of amenity protection for nearby land users. In view of the fact that the buffer zone requirement around the facility only applies until such time as the landfill activity of a particular cell is completed, the EPA considers that the required buffer zone of 500 m to the South of the facility would only impact on the timing of the Temarup Estate subdivision, without placing a constraint against the ultimate development of the land.

The WMD is presently preparing a draft Post Closure Management Policy for landfills. This policy is expected to be finalised prior to operation of the proposed Class IV cells. The policy will detail the decommissioning criteria that must be met in order for the external buffer zone requirement to be lifted, and is acknowledged in the proponent's commitment to prepare a post closure management plan.

The EPA understands that, through discussions undertaken by the proponent with the current land owners, proposed developers and planning consultants, and through correspondence with the relevant planning authorities, the current requirement for buffer zones has been recognised in the staging plan and planning approval of the Temarup Estate.

Having particular regard to the:

- (a) requirement and need for adequate buffer zone for all landfills;
- (b) nature of the Class IV cells and the waste received;
- (c) proponent's management of planning issues; and
- (d) proponent's commitment to prepare a post closure management plan,

it is the EPA's opinion that the existing buffer zone requirement for the facility can provide adequate amenity protection for nearby land users and can be managed through the planning approval process, thus meeting the EPA's objective for this factor.

#### **4. Conditions**

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal, and following discussion with the proponent the EPA may seek additional commitments.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for and commitment to continuous improvement in environmental performance. The commitments then form part of the conditions to which the proposal should be subject if it is to be implemented.

The EPA may, of course, also recommend conditions additional to that relating to the proponent's commitments.

The EPA recommends that the following conditions, which are set out in formal detail in Appendix 4, be imposed if the proposal by the EMRC to establish Class IV waste disposal cells is approved for implementation:

- (a) the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 4;
- (b) in order to manage the relevant factors and EPA objectives contained in this bulletin, and subsequent conditions and procedures authorised by the Minister for the Environment, the proponent shall be required to prepare, prior to implementation of the proposal, environmental management system documentation with components such as those adopted in Australian Standards AS/NZ ISO 14000 series.

#### **5. Conclusions**

The EPA has considered the proposal by the EMRC to establish Class IV (low hazard) waste disposal cells at its existing Red Hill Waste Disposal Facility. This assessment involved consideration of the preliminary design of the Class IV cells and the potential environmental impacts.

The EPA notes the high integrity of the proposed Class IV cells design and current high standard of site management, including surface and groundwater management, and has concluded that the proposal by the EMRC to establish Class IV waste disposal cells at its existing Red Hill Waste Disposal Facility can be managed to meet the EPA's objectives, provided that the conditions recommended in Section 4, and set out in formal detail in Appendix 4, are imposed.

The EPA believes that the proposal meets the community need for a Class IV waste disposal facility to provide a secure and more practical means for disposal of large quantities of contaminated soils generated from the clean up of contaminated sites in the Perth metropolitan region, which otherwise could only be disposed of at the State Government owned Intractable Waste Disposal Facility at Mt Walton East, approximately 475 km north east of Perth.



## 6. Recommendations

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister for the Environment considers the report on the relevant environmental factors and the EPA objectives set for each factor.
2. That the Minister for the Environment notes that the EPA has concluded that:
  - the proposed Class IV cell design is of high standard;
  - the proposal can be managed to meet the EPA's objectives; and
  - the proposal meets the community need for a Class IV waste disposal facility in close proximity to the Perth metropolitan region.
3. That the Minister for the Environment imposes the conditions and procedures consistent with Section 4 of this report.

**CLASS IV DISPOSAL CELLS AT REDHILL WASTE DISPOSAL FACILITY - EASTERN METROPOLITAN REGIONAL COUNCIL**

**Table 3: Summary of Assessment of Relevant Environmental Factors**

FACTOR	RELEVANT AREA	EPA OBJECTIVES	EPA's ASSESSMENT	EPA's ADVICE
<b>Surface Water Quality</b>	Susannah, Strelly and Jane Brook catchments.	Maintain or improve the quality of surface water in accordance with the requirements of the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA Bulletin 711).	<p>The surface water collection system and the storm water holding capacity available in the leachate pond and on the cells provide for a 1 in 100 year storm event.</p> <p>The ongoing monitoring of groundwater has been satisfactory to date.</p> <p>The Water and Rivers Commission has advised that the proposed design and operation of the Class IV cells and leachate pond is acceptable.</p> <p>The DEP's Waste Management Division (WMD) has confirmed that the management of surface water has been satisfactory to date on the basis of site inspections.</p> <p>Proponent's commitments:</p> <ol style="list-style-type: none"> <li>1. Ensure downstream water quality maintains standards aimed at protecting freshwater ecosystems;</li> <li>3. Consult with the DEP on sampling parameters and criteria for surface water monitoring.</li> </ol>	<p>Having particular regard to:</p> <ul style="list-style-type: none"> <li>• the current high standard of surface water management;</li> <li>• the results of the surface water monitoring, to date;</li> <li>• the design of the surface water collection system;</li> <li>• the proponent's commitments; and</li> <li>• the criteria in the draft Western Australian Water Quality Guidelines for Fresh and Marine waters (EPA Bulletin 711),</li> </ul> <p>it is the EPA's opinion that the proposal can be managed to meet the EPA's objective.</p>
<b>Groundwater Quality</b>	Proposal area and superficial aquifer down hydraulic gradient from the Class IV cells and leachate ponds.	Maintain the quality of groundwater in accordance with the requirements of the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA Bulletin 711).	<p>The site's hydrogeology meets the DEP's criteria for Class IV waste disposal.</p> <p>The high integrity design of the Class IV cells, particularly the primary and secondary leachate protection linings, provides a high level of groundwater protection.</p> <p>The ongoing monitoring of groundwater has been satisfactory to date.</p> <p>WMD has advised that the management of groundwater has been to a high standard.</p> <p>Proponent's commitments:</p> <ol style="list-style-type: none"> <li>1. Maintain acceptable groundwater quality standards aimed at protecting freshwater ecosystems and groundwater users (including on-going monitoring).</li> <li>2. Establish procedures for follow up monitoring and remedial action in the event that monitoring detects possible failure of leachate containment system.</li> <li>3. Provide separate wash-down facility for trucks delivering to Class IV cells, which will collect wash waters and drain to leachate containment system.</li> </ol>	<p>Having particular regard to:</p> <ul style="list-style-type: none"> <li>• the high integrity design of the Class IV cells;</li> <li>• the current high standard of groundwater management;</li> <li>• the relatively impermeable kaolinitic clays; and</li> <li>• the proponent's commitments,</li> </ul> <p>it is the EPA's opinion that the proposal can be managed to meet the EPA's objective.</p>
<b>Buffer zone</b>	Waste disposal site area and land adjacent to the site boundary	Protect the amenity of nearby residents from emissions of odour, dust and noise associated with activities from the site.	<p>The buffer requirements for landfills are; a 50 m internal buffer, a 150 m primary buffer and a 500 m secondary buffer.</p> <p>WMD advise that Class IV waste will typically be less odorous than Class II or III waste and would therefore not require an additional buffer.</p> <p>The proponent has taken appropriate action to address buffers through the planning process.</p> <p>Proponent's commitments:</p> <ol style="list-style-type: none"> <li>1. The current buffer requirements for the site will be maintained through planning approval processes and will not be increased as a result of the proposal.</li> </ol>	<p>Having particular regard to:</p> <ul style="list-style-type: none"> <li>• the requirement for adequate buffer zones for all landfills;</li> <li>• the nature of the Class IV cells and the waste received;</li> <li>• the proponent's management of planning issues; and</li> <li>• the proponent's commitment to prepare a post closure management plan,</li> </ul> <p>it is the EPA's opinion that the EPA's objective can be managed through the current agreement between the proponent, the WMD and the land owners.</p>

## **Appendix 1**

**Figures and tables relating to proposal**





REDHILL LANDFILL FACILITY  
CLASS IV WASTE DISPOSAL CELLS

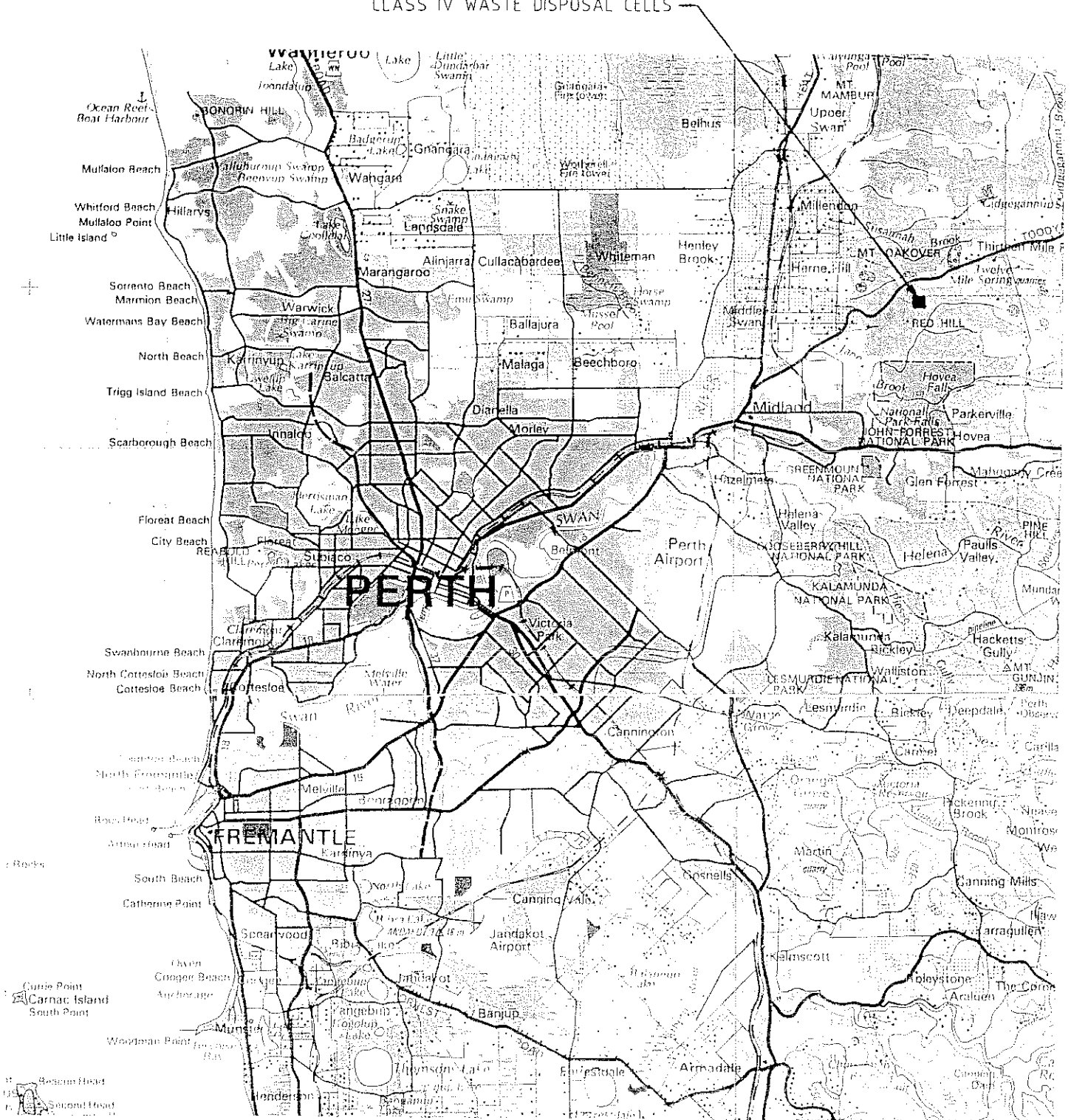
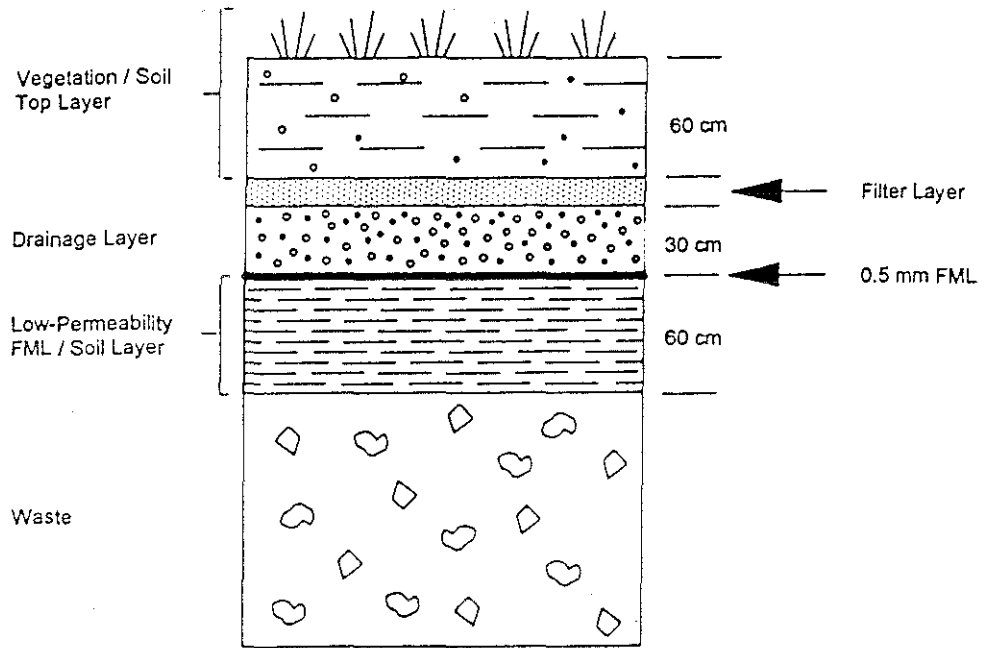


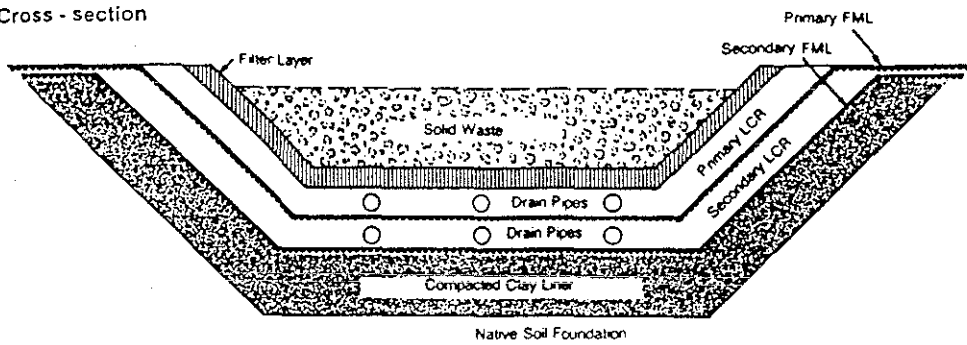
Figure 1. Eastern Metropolitan Regional Council, Redhill Class IV waste disposal cells, site location plan.

USEPA - recommended cover design



Schematic of synthetic / composite double liner system

A. Cross - section



B. Profile of double liner system

Minimum Thickness	Layer Description	Hydraulic Conductivity	System Component
15 cm	Filter Media		
30 cm	Primary LCR	$\geq 10^{-2}$ m/sec	Primary LCR
0.76 cm	Primary FML		Primary FML
30 cm	Secondary LCR	$\geq 10^{-2}$ m/sec	Secondary LCR
0.76 cm	Secondary FML		Secondary FML
90 cm	Clay Liner	$\leq 10^{-9}$ m/sec	Clay Liner
	Unsaturated Zone		Native Soils

Note:  
 LCR = Leachate Collection and Removal System  
 FML = Flexible Membrane Liner

Figure 3. Recommended design features.

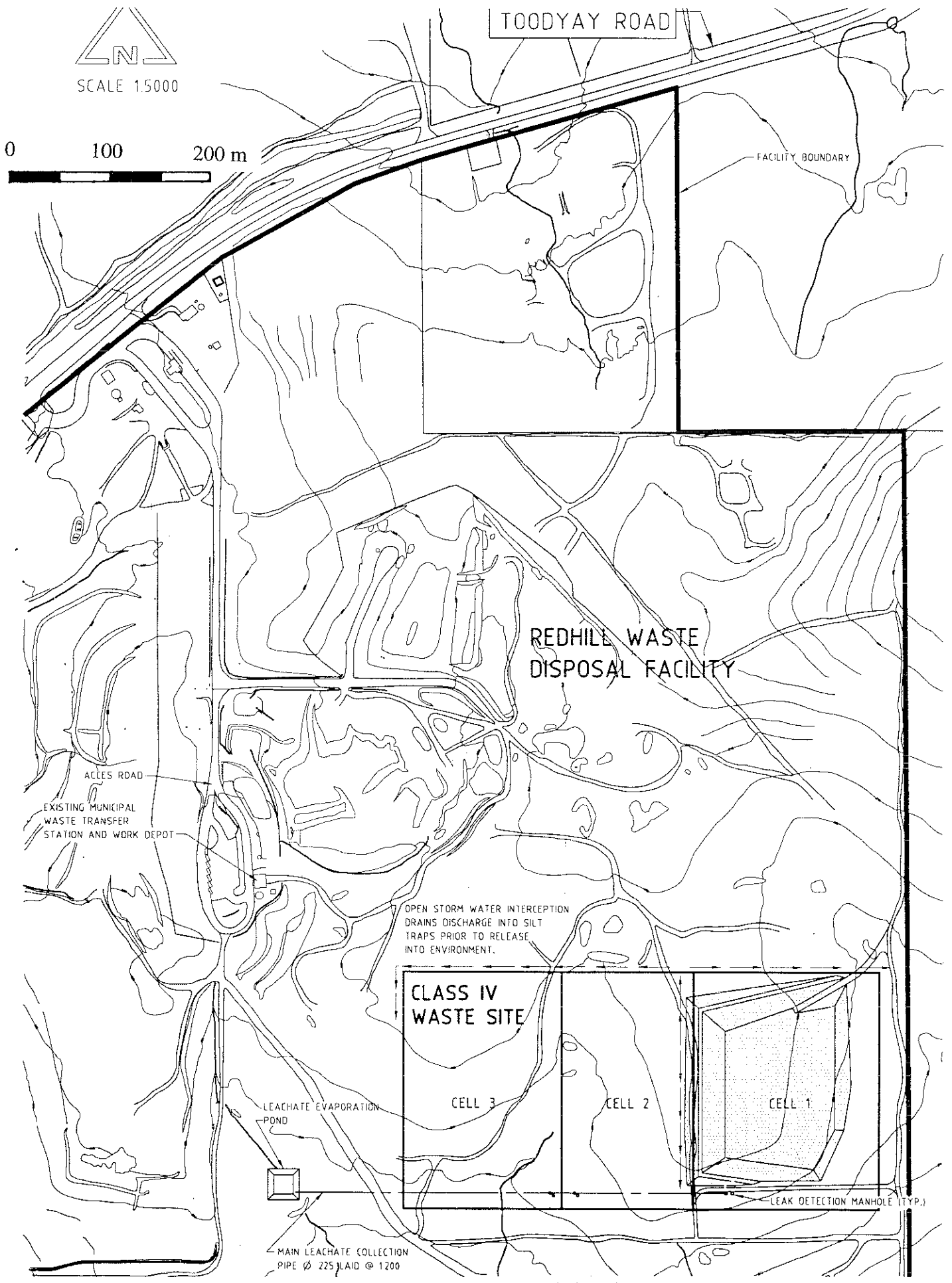
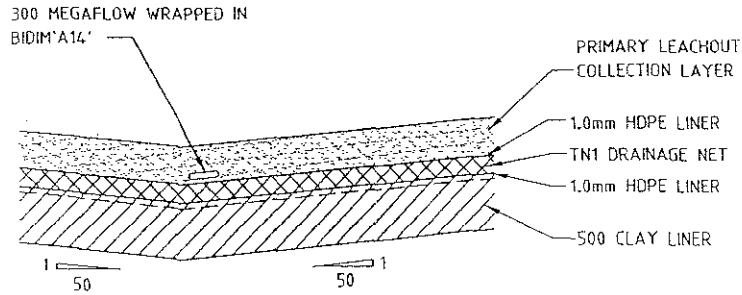
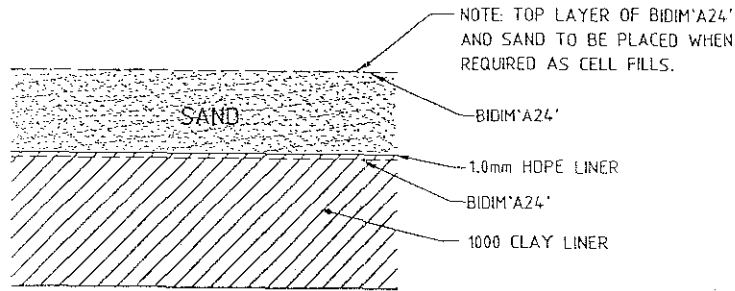


Figure 2. Eastern Metropolitan Regional Council, Redhill Class IV waste disposal cells general arrangement.

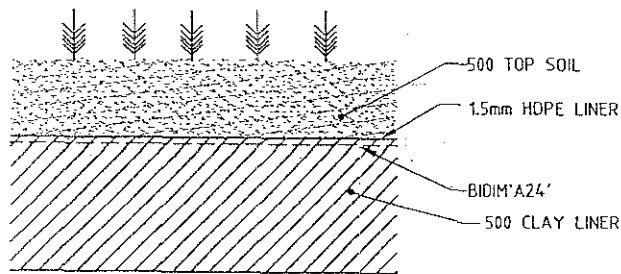
Figure 4. Eastern Metropolitan Metropolitan Regional Council, Redhill Class IV waste disposal cells typical section.



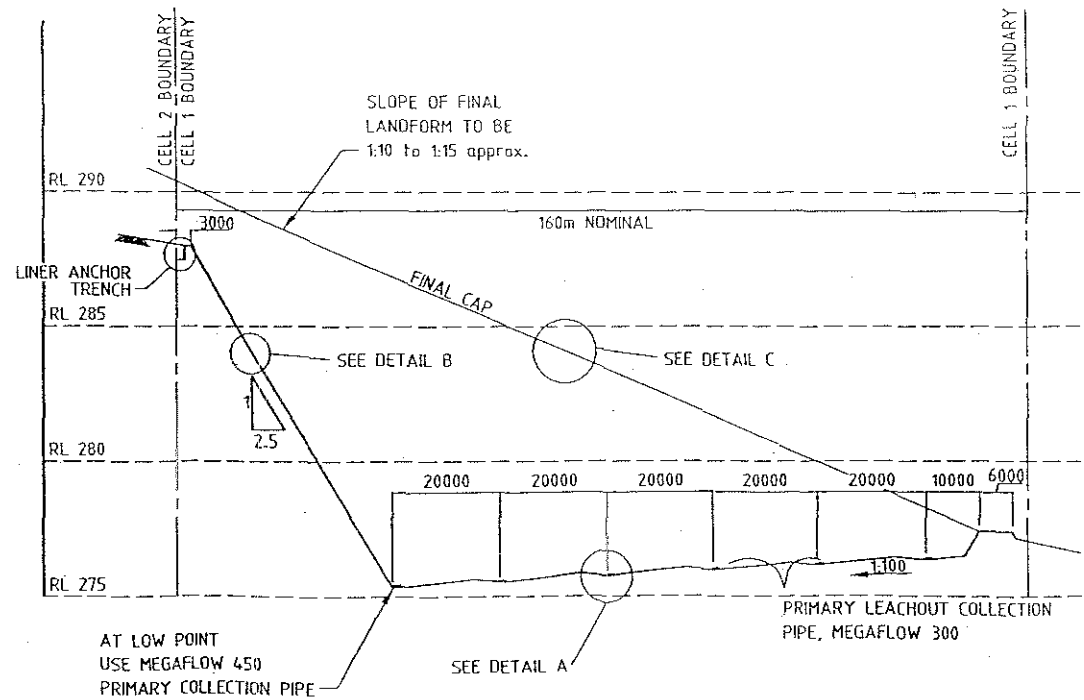
DETAIL A - BASE  
(OPTION 1 LINER)



DETAIL B - SIDE WALLS



DETAIL C - CAPPING



TYPICAL SECTION

SCALE: 1:200V  
1:1000H



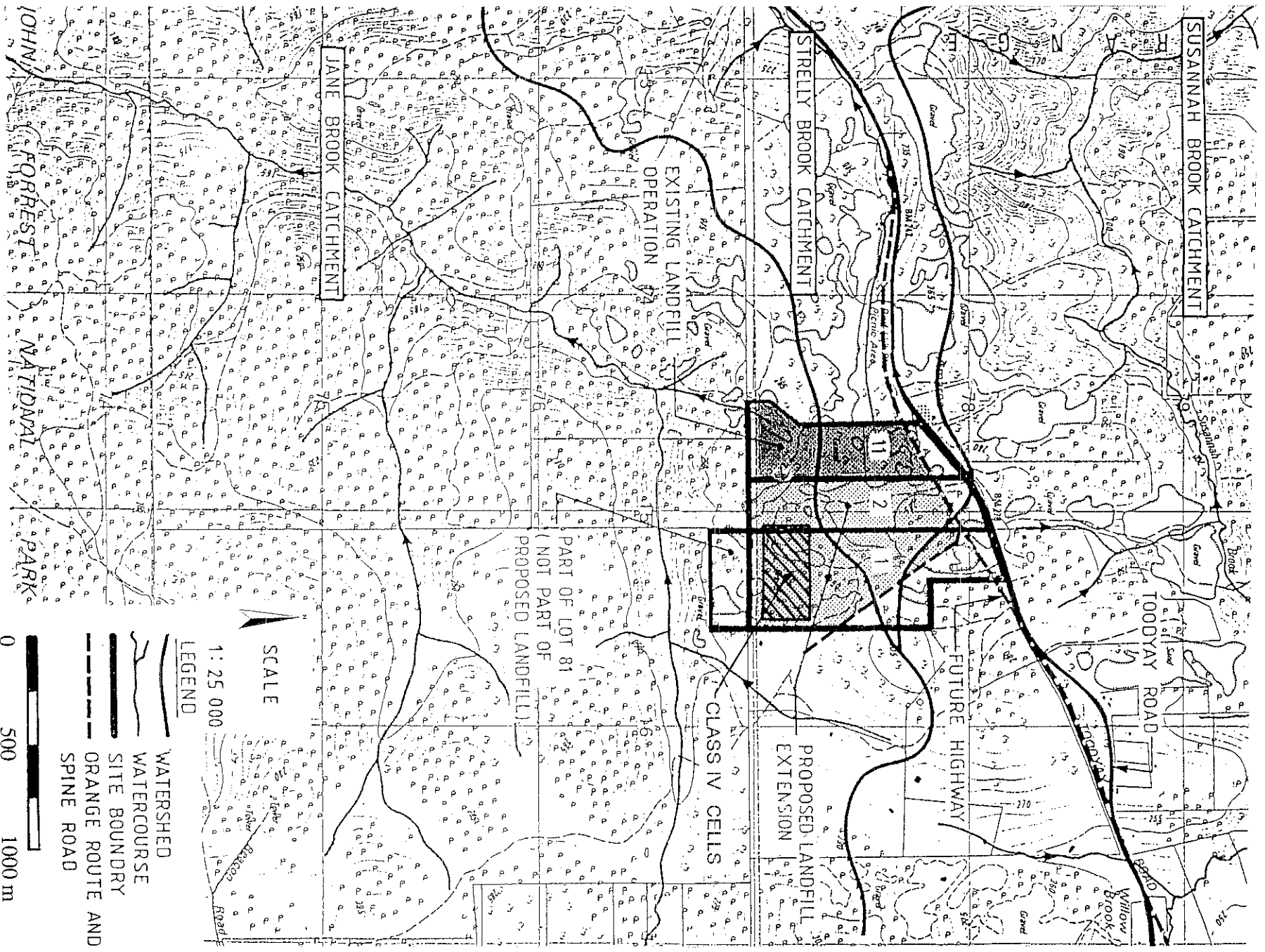
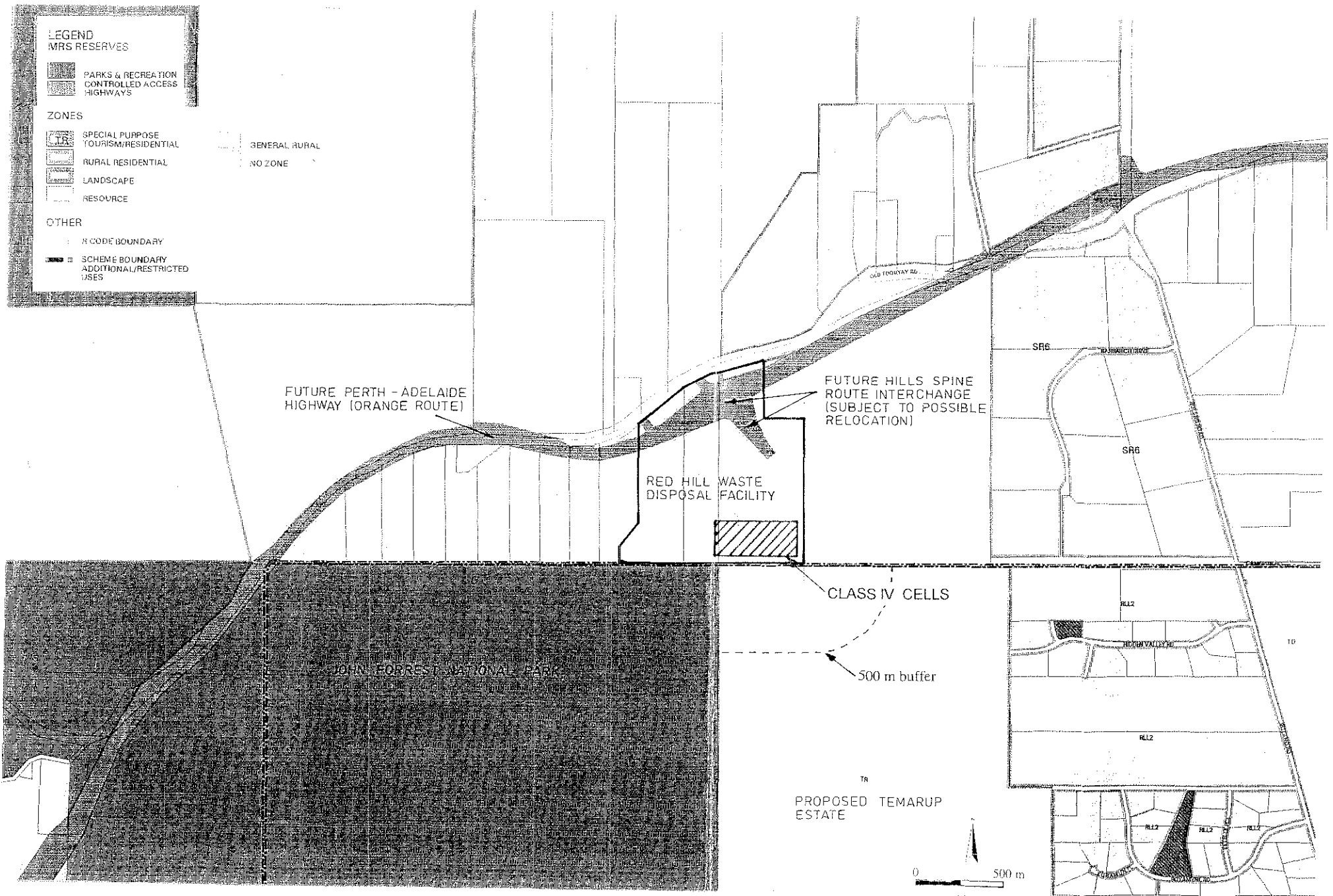


Figure 5. Red Hill waste disposal facility, catchments and watercourses.

Figure 6. Red Hill waste disposal site.



Landfill Type	Landfill Class	Waste Types Accepted
Inert	I	Inert wastes: including construction and demolition waste and uncontaminated soil.
Putrescible	II	Inert waste Putrescible waste Low hazard waste (Class II Type 1) Special waste (Class II Type 1)
Putrescible	III	Inert waste Putrescible waste Low hazard waste (Class III Type 1) Special waste (Class III Type 1)
Secure	IV	Low hazard waste (Type 2) Special waste (Type 2)
Intractable	V	Intractable waste only

Low hazard waste is waste containing low levels of heavy metals, polycyclic aromatic hydrocarbons or other organic compounds in either low concentrations or in forms which do not pose an acute hazard as defined as low hazard type 1 & 2 of the Waste Acceptance Criteria 1996 (DEP, 1996a).

Special waste (type 2)

- Asbestos waste as defined by and managed within the Health (Asbestos) Regulations 1994 and which is appropriately packaged for disposal.
- Clinical and related wastes which are suitable for disposal to landfill as defined in the Code of Practice for Wastes in Health Care Units published by the Health Department of WA. Copies are available from Waste Management Division).

Table 1 Landfill Types, Classes and their Waste Acceptance.

KEY ENVIRONMENTAL FACTOR	PRESENT STATE	POTENTIAL IMPACTS OF PROPOSAL	ENVIRONMENTAL MANAGEMENT OBJECTIVES	STATE OF THE ENVIRONMENT
<u>BIOPHYSICAL</u> * Landforms	Modified by landfilling activities but integrated with natural landforms.	Marginal increase in landform modification associated with Class IV cells.	To ensure final landforms blend in with the surrounding landscape.	A modified and rehabilitated landscape which integrates with natural landforms.
* Vegetation/Flora	Moderate species diversity which has been subject to disturbance from landfilling activities. No declared rare flora species at the site.	Marginal increase in vegetation removal and rehabilitation associated with Class IV cells.	To maintain species diversity in rehabilitated landfill cells and establish a sustainable vegetation cover.	Rehabilitated landfill cells which resemble the surrounding forest in the long term.
* Dieback Disease	Disease present, or has impacted highly over most of the site.	Increased activity may result in greater disease expression.	To ensure dieback disease is not spread to surrounding forest as a result of landfilling activities.	A rehabilitated environment with moderate species diversity which provides conditions unsuitable for dieback survival in accordance with CALM's Dieback Disease Hygiene Manual (1992) and the EMRC Dieback Management Policy (1997).
<u>POLLUTION</u> * Surface Water	Background water quality and levels of pollutants in stormwater discharge off-site are monitored three monthly and are within acceptable standards.	Marginal increase in pollutant loadings and volumes of stormwater discharged off-site.	To ensure that downstream water quality maintains standards aimed at protecting freshwater ecosystems through periodic monitoring.	Acceptable water quality in receiving environments being similar to monitored background levels. Based on the Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993).
* Groundwater	Groundwater monitored at three monthly intervals with pollutant levels generally within acceptable standards.	Possible increase in levels of pollutants in groundwater with low risk of off-site impacts from contaminated groundwater.	To maintain acceptable groundwater quality standards aimed at protecting freshwater ecosystems and groundwater users through periodic monitoring.	Acceptable groundwater quality at the perimeter of the site being similar to background levels. Based on the Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993).
* Noise	Noise levels at nearest resident well within existing and proposed noise regulations.	Negligible increase in noise levels, but likely to remain well within existing and proposed noise regulations.	To ensure noise levels as a result of the construction and operation of Class IV cells remains within existing and proposed noise regulations.	Noise levels similar to existing and within noise regulations.
* Dust	Dust levels managed at site and in accordance with DEP Dust Control Guidelines.	Marginal increase in dust associated with Class IV cells, but likely to be restricted to the site with no off-site impacts.	To minimise dust impacts on-site in accordance with DEP Dust Control Guidelines.	Dust levels similar to existing and in accordance with DEP Dust Control Guidelines.
<u>SOCIAL</u> * Odour	Odour impacts generally acceptable, apart from isolated complaints during adverse weather conditions.	Negligible increase in odour levels as a result of operating Class IV cells.	To maintain current odour control standards and reduce the incidence of isolated odour complaints.	Odour levels to be acceptable with reduced complaints of odour impacts from nearby residents.

Table 2 Environmental Impacts identified in the CER (EMRC, 1997).

<b>* Parameter</b>	<b>Range of Values Monitored On-site (1985-1994)</b>	<b>Background Levels (Jane Brook)</b>	<b>Water Quality Criteria Value</b>
Total Phosphorus (P) mg/l	0.01 - 0.25	0.01 - 0.42	<0.25
Total Nitrogen (N) mg/l	1.0 - 11.0	0.01 - 5.0	<5.0
TDS mg/l	90 - 400	200 - 956	<1000
pH	6.2 - 8.1	6.0 - 7.9	6.0 - 9.0
Conductivity ms/cm <sup>2</sup>	120 - 570	100 - 900	<1000
Arsenic (As) mg/l	0.045 - <0.005	<0.01	<0.01
Cadmium (Cd) mg/l	<0.005 - 0.01	<0.01	<0.01
Chromium (Cr) mg/l	<0.005 - 0.02	<0.05	<0.05
Copper (Cu) mg/l	0.004 - 0.05	<0.1	<0.05
Iron (Fe) mg/l	<0.005 - 0.35	<0.45	<0.50
Lead (Pb) mg/l	0.0014 - 0.01	<0.1	<0.01
Zinc (Zn) mg/l	<0.05 - 0.25	<0.65	<0.50

\* Frequency and parameters for groundwater monitoring will be determined in consultation with the DEP and based on the chemical characteristics of the contaminants in the material deposited in the Class IV cells.

Table 3 Current Surface Water Quality Criteria for the Red Hill Waste Disposal Facility.



## **Appendix 2**

### **List of submitters**





## **List of organisations and individual who made submissions**

### **Organisations:**

Water and Rivers Commission

Health Department of Western Australia

Conservation Council of Western Australia

Shire of Mundaring

### **Individual:**

Greg Rowe and Associates on behalf of their client, the Chambers family



## **Appendix 3**

### **References**



- DEP (1996a) *Landfill Waste Classification and Waste Definition*. Department of Environmental Protection, Government of Western Australia, September, 1996.
- DEP (1996b) *Proposed Site Selection Requirements and Waste Acceptance Criteria for Low Hazard Waste in Western Australia* Department of Environmental Protection, Government of Western Australia, July, 1996.
- EMRC (1997) *Proposal to establish Class IV waste disposal cells at Red Hill Waste Disposal Facility Consultative Environmental Review*. Eastern Metropolitan Regional Council.
- EPA (1992) *Red Hill Waste Management Facility Extension*. Environmental Protection Authority Bulletin 569, 1991.
- EPA (1993) *Draft Western Australian Water Quality Guidelines for Fresh and Marine Waters*. Environmental Protection Authority Bulletin 711, October 1993.
- GHD (1997) *Redhill Class IV Waste Disposal Cell - Preliminary Design Report*. by Gutteridge Haskins & Davies Pty Ltd for the Eastern Metropolitan Regional Council, May, 1997.
- HDWA (1993) *Criteria for Landfill Management* Health Department of Western Australia, Government of Western Australia, October, 1993.



## **Appendix 4**

### **List of recommended Ministerial Conditions and proponent's consolidated commitments**





## ***RECOMMENDED MINISTERIAL CONDITIONS***

### **CLASS IV WASTE DISPOSAL CELLS RED HILL WASTE DISPOSAL FACILITY, TOODYAY ROAD, RED HILL, SHIRE OF SWAN (1088)**

#### **EASTERN METROPOLITAN REGIONAL COUNCIL (EMRC)**

This proposal may be implemented subject to the following conditions:

#### **1 Proponent Commitments**

The proponent has made a number of environmental management commitments in order to protect the environment.

- 1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Consultative Environmental Review and subsequently during the environmental assessment process conducted by the Environmental Protection Authority and those made as part of the fulfilment of the requirements of conditions in this statement requiring the preparation of an environmental management programme; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

In the event of any inconsistency, the conditions and procedures shall prevail to the extent of the inconsistency.

The attached Consolidated Environmental Management Commitments form the basis for consideration by the Chief Executive Officer of the Department of Environmental Protection for auditing of this proposal in conjunction with the conditions and procedures contained in this statement.

#### **2 Implementation**

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

- 2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal.
- 2-2 Where, in the course of the detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

#### **3 Proponent**

These conditions legally apply to the nominated proponent.

- 3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination

of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

#### **4 Environmental Management System**

The proponent should exercise care and diligence in accordance with best practice environmental management principles.

4-1 In order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to construction, the proponent shall prepare environmental management system documentation with components such as those adopted in Australian Standards AS/NZS ISO 14000 series, in consultation with the Department of Environmental Protection.

4-2 The proponent shall implement the environmental management system referred to in condition 4-1.

#### **5 Decommissioning**

5-1 The proponent shall carry out the decommissioning of the project, removal of the plant and installations and rehabilitation of the site and its environs.

5-2 At least six months prior to decommissioning, the proponent shall prepare a decommissioning and rehabilitation plan to achieve the objectives of condition 5-1.

5-3 The proponent shall implement the plan required by condition 5-2.

#### **6 Commencement**

The environmental approval for the substantial commencement of the proposal is limited.

6-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period to the Minister for the Environment.

Where the proponent demonstrates to the requirements of the Minister for the Environment 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.

#### **7 Performance Review**

The proponent should review the environmental performance of the proposal to ensure that the environmental management meets the environmental objectives and allows for continuous improvement.

7-1 Each six years following the commencement of construction, the proponent shall prepare and submit a performance review to evaluate the environmental performance, which shall include, but not be limited to:

1 environmental objectives reported on in Environmental Protection Authority Bulletin 86X;

2 proponent environmental management commitments made in the Consultative Environmental Review, those made in response to issues raised following public

submissions, and those published in Environmental Protection Authority Bulletin 86X (as Appendix 4);

- 3 Environmental Management System environmental management targets;
- 4 environmental management plans; and
- 5 environmental performance indicators,

to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

Note: The Environmental Protection Authority may recommend changes and where significant, recommend actions, to the Minister for the Environment following consideration of the performance review.

## **8 Compliance Auditing**

To help determine environmental performance and compliance with the conditions, periodic reports on the implementation of the proposal are required.

- 8-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

### **Procedure**

- 1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.
- 2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

### **Note**

- 1 The Environmental Protection Authority reported on the proposal in Environmental Protection Authority Bulletin 86X (November 1997).
- 2 The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the Environmental Protection Act.

**Consolidated Environmental Management  
Commitments**

24 October 1997

**RED HILL WASTE DISPOSAL FACILITY,  
CLASS IV WASTE DISPOSAL CELLS  
TOODYAY ROAD, RED HILL, SHIRE OF SWAN  
(1088)**

**EASTERN METROPOLITAN REGIONAL COUNCIL  
(EMRC)**

## CONSOLIDATED ENVIRONMENTAL COMMITMENTS

The environmental commitments proposed for the Class IV project defines the EMRC's responsibilities to undertake required actions to ensure the project is environmentally acceptable. These environmental commitments are usually translated into legally binding actions upon ministerial approval. The environmental commitments have been structured around the key environmental factors identified in the environmental impact and management phase. This list of consolidated environmental commitments also incorporates issues and additional commitments raised during the CER public submission period.

### 1. DESIGN AND CONSTRUCTION

The proposed Class IV landfill cells will be designed and constructed in accordance with the DEP guidelines for the disposal of low hazard waste as described in this report.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Design and construction	EMRC	DEP Site Selection and Waste Acceptance Criteria in Western Australia (DEP 1996c).	The Class IV cells will be designed and constructed in accordance with DEP guidelines for the disposal of low hazard waste in landfill cells as described in this report.	To commence following EPA and Ministerial approval and will remain an ongoing priority.	DEP

### 2. LANDFORM REHABILITATION

Following the completion of Class IV waste cells, the land surface will be contoured and rehabilitated to resemble that of the surrounding landforms. All landform rehabilitation will consider drainage management, erosion, visual impacts and landscape amenity in a manner that does not compromise the long term rehabilitation objectives for the site.

The final landform reconstruction of each cell will be designed to link with other landfilled areas and also integrate with surrounding natural surface levels not required for landfill purposes.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Landforms	EMRC	The EMRC 5 Year Development Plans (prepared annually)	The design, earthworks and rehabilitation processes will ensure the final landform blends into the surrounding landscape.	To be progressively implemented on an ongoing basis.	DEP

### 3. VEGETATION/ FLORA REHABILITATION

The EMRC has prepared a Rehabilitation Program (EMRC, 1995b) outlining short, moderate and long term rehabilitation objectives for completed landfill areas. This document focuses upon enhancing the re-establishment of native vegetation species using a staged approach which maximises revegetation success whilst recognising the landfill cell decomposition process.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Vegetation/ Flora	EMRC	The EMRC Rehabilitation Program (EMRC, 1995b).	Maintain species diversity in rehabilitated landfill cells and establish a sustainable vegetation cover.	To be progressively implemented on an ongoing basis.	DEP/EPA

### 4. DIEBACK DISEASE

The Red Hill Waste Disposal Facility is treated as dieback infected with current environmental controls (rehabilitation, drainage management, retention of bushland buffers and minimising disturbance) ensuring that there are no off-site dieback impacts as a result of landfilling activities.

The EMRC has produced a Dieback Management Policy (EMRC, 1997) which identifies strategies and objectives to be adopted at the Red Hill Waste Disposal Facility.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Dieback Disease	EMRC	CALM Dieback Disease Hygiene Manual (CALM, 1992) and the EMRC Dieback Management Policy (EMRC, 1997).	Implement strategies pertaining to the Dieback Policy to ensure dieback is not spread to the surrounding forest.	To be progressively implemented on an ongoing basis.	DEP/EPA

### 5. SURFACE WATER

The construction of silt traps and siltation ponds and the proposed extension of the surface water monitoring program to include the proposed siltation pond servicing with the Class IV cells will ensure water quality impacts are minimised.

The proposed environmental management objective for surface water is to ensure water allowed to discharge off-site will maintain downstream water quality to a level which protects freshwater ecosystems (EPA, 1993).

Commitment	Organization Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Surface Water	EMRC	Part V - Control of Pollution. Environmental Protection Act (DEP, 1986a).	Ensure downstream water quality maintains standards aimed at protecting freshwater ecosystems. Sampling criteria for surface water monitoring will be developed in conjunction with the DEP (Waste Management Division) on advice from the Water and Rivers Commission.	Monitoring is conducted at three monthly intervals.	DEP

## 6. GROUNDWATER

Groundwater monitoring will be undertaken through bores located immediately down gradient of the leachate pond and will be compared to baseline groundwater data gathered from other areas of the site.

Groundwater monitoring parameters will be similar to those imposed on the surface water runoff with the environmental management objectives focused on maintaining acceptable groundwater standards aimed at protecting freshwater ecosystems and groundwater users (EPA, 1993).

Commitment	Organization Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Groundwater	EMRC	Part V - Control of Pollution. Environmental Protection Act (DEP, 1986a).	Maintain acceptable groundwater quality standards aimed at protecting freshwater ecosystems and groundwater users. Separate wash-down facility for trucks delivering to the Class IV cells will be provided, and the washwaters will be collected and drained to the leachate containment system. In the event that monitoring detects possible failure of leachate containment system, follow-up monitoring will be undertaken to determine the source(s) and significance, prior to any remedial action. The remedial action will be determined in consultation with the DEP (Waste Management Division) and Water and Rivers Commission. A contingency plan for the management of groundwater pollution will be prepared.	Monitoring is conducted at three monthly intervals.	DEP

## 7. NOISE

The noise emissions associated with the operation and construction of Class IV cells will conform with the DEP's existing and proposed noise regulations. The Class IV proposal will have a minimal impact on noise levels within, or in areas surrounding the site.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Noise	EMRC	Part V - Control of Pollution. Environmental Protection Act (DEP, 1986a).	Maintain noise emissions within existing and proposed regulations.	To be maintained on an ongoing basis.	DEP

## 8. DUST/PARTICULATES

The implementation of dust suppression strategies will collectively ensure that dust levels are managed in accordance with the DEP Dust Control Guidelines.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Dust/Particulates	EMRC	Part V - Control of Pollution. Environmental Protection Act (DEP, 1986a).	Dust suppression strategies will continue to be implemented in accordance with the DEP Dust Control Guidelines. A high volume dust sampling programme will be developed and implemented in conjunction with the DEP (Waste Management Division), to establish base line information and to determine the need for on-going monitoring (if necessary) for dust emissions from the site.	To be maintained on an ongoing basis.	DEP

## 9. ODOUR

The odour suppression strategies for Class IV material will be an extension of current odour management techniques resulting in acceptable odour levels throughout the site. Due to the nature of the waste, odours emanating from Class IV cells are unlikely to have an unacceptable impact on the surrounding environment.



Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Odour	EMRC	Part V - Control of Pollution. Environmental Protection Act (DEP, 1986a).	The current odour suppression strategy pertaining to Class III waste will be applied to Class IV waste. Current buffer requirements will be maintained through planning approval processes and will not be increased as a result of the operation of Class IV cells.	To be maintained on an ongoing basis.	DEP

## 10. COMMUNITY INVOLVEMENT

The EMRC's community consultation approach will ensure that community concerns are addressed on an ongoing basis. Provisions for community access to EMRC meeting minutes are currently in place. The EMRC also conducts annual "Open Days" and is intending to actively involve the community in the development of their Environmental Management System (EMS) for the site.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Community Involvement	EMRC	EMRC policy.	The EMRC will address any concerns raised by the community. Public access to EMRC meeting minutes, invitations to "Open Days" and community involvement in EMS.	To be maintained on an ongoing basis.	DEP/EPA

## 11. POST CLOSURE MANAGEMENT

The EMRC continually reviews rehabilitation plans and proposes to prepare a Post Closure Management Plan for the site.

The EMRC also allocates funding each year to its Environmental Monitoring Reserve Fund to allow for the future funding of post closure monitoring to be conducted.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Post Closure Management	EMRC	The EMRC 5 Year Development Plan and Post Closure Management Plan (EMRC, 1995a).	Development of a Post Closure Management Plan.	To be developed during the 1997/98 financial year.	DEP

## 12. END USE

The EMRC intends to create an environment suitable for a passive recreation end use. Following decommissioning, it is envisaged that the site could be rehabilitated with low impact developments such as picnic areas, nature trails and possible lookouts positioned as a background to the magnificent views of the Swan Coastal Plain and the city beyond.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
End Use	EMRC	The EMRC 5 Year Development Plan and Post Closure Management Plan (EMRC, 1995a).	The establishment of an environment suitable for passive recreation.	To be maintained on an ongoing basis.	DEP

## 13. ENVIRONMENTAL MANAGEMENT SYSTEM

The EMRC is committed toward the preparation of an EMS for the Red Hill Waste Disposal Facility.

Commitment	Organisation Responsible	Environmental Management Specification	Proposed Action	Time Frame	Governing Body
Environmental Management system (EMS)	EMRC	In accordance with ISO 14001.	To develop an EMS for the site.	During the 1997/98 and 1998/99 financial years.	DEP