Proposal for additional landscape works and extension of fly ash ponds — Turkey Point, Bunbury

State Energy Commission of Western Australia

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 620
April 1992

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's recommendations.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the assessment report recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of $10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
18th Floor, Allendale Square
77 St George's Terrace
PERTH WA 6000

CLOSING DATE

Your appeal (with the $10 fee) must reach the Minister's office no later than 5.00 pm on 17 April, 1992.

Recommendation 4

The Environmental Protection Authority recommends that the State Energy Commission of Western Australia should monitor the progress in the establishment of the fauna and flora in the rehabilitated wetland and provide a detailed report to the Environmental Protection Authority prior to transferring management responsibility for the wetland to the City of Bunbury.

Recommendation 5

The Environmental Protection Authority recommends that the rehabilitated wetland should be nominated for inclusion in the Environmental Protection (Lakes) Policy 1992 when the area is revested in the City of Bunbury.

1. Introduction

In January 1991, the State Energy Commission of Western Australia (SECWA) referred to the Environmental Protection Authority for assessment a proposal for additional landscape works and an expansion of its fly ash disposal from its Bunbury Power Station. The fly ash was proposed to be disposed of by filling the remaining portion of a degraded estuarine wetland at Turkey Point, Bunbury, Western Australia. This degraded tidal wetland is a portion of a much larger area that has been progressively filled by SECWA over the past ten years with fly ash from the Bunbury Power Station. The remaining area is approximately 1.5 hectares in size and located on the south side of Turkey Point, north of the Bunbury Harbour (see Figure 1).

The proposal was referred for assessment because of its impact on the remaining portion of the wetland, and because of possible leachate movement into the Leschenault Inlet.

2. The proposal

The proposal received from SECWA in January 1991 involved the construction of two retention ponds within the remaining portion of the wetland. The first retention pond will receive fly ash directly from the power station. Decant water from this fly ash is then directed into the second pond before ultimately being discharged into the Leschenault Inlet. Both ponds will be gradually filled over the remaining life of the power station, ie six years. Once filled the area will be stabilized, covered with soil, and revegetated with trees and lawn in accordance with a landscape plan approved by the City of Bunbury. This approach is consistent with that implemented in the wetland areas previously filled.

This proposal was modified in mid 1991 following discussions with the EPA. A revised proposal was submitted which reflected the Authority's advice that a wetland of similar ecological function and area should be reconstructed on the site to compensate for the destruction of the original system.

The modified proposal involves the construction of the retention ponds which have been reduced in size, and excavation and landscaping of the remaining wetland according to design guidelines outlined in an environmental enhancement plan. Fly ash and marl (calcium carbonate) will be used to construct the banks and base of the retention ponds and soil imported as fill to achieve the desired landform elsewhere. A permanent and semi-permanent water body linked to the estuary will be constructed to maintain the hydrological regime, provide water bird habitat and improve aesthetics. Native vegetation in good condition will be retained on site and a diversity of wetland and dry schlerophyl plant species planted over the life of the project. The enhancement plan also attempts to blend the wetland into the existing environment.

Public access to the area will be restricted during the development phase (six years) although the site can be viewed from adjacent slopes. Walking trials linked to near-by parkland may be constructed in the future. These trails would wind through the wetland enabling walkers, cyclists and people in wheel chairs to visit different plant and animal habitats. The trails may incorporate raised board-walks and small bridges to minimise the physical impact on the environment. An information board explaining the concept to the public will also be constructed.

3. Environmental impact and management

The proposal will have an impact on the landscape, hydrology, vegetation, fauna and conservation value of the site. These impacts are outlined below.

3.1 Landscape and hydrology

The impact of the proposal upon the landscape and hydrology can be gained by comparing a typical cross section of the wetland before and after modification (see Figure 2). It can be seen

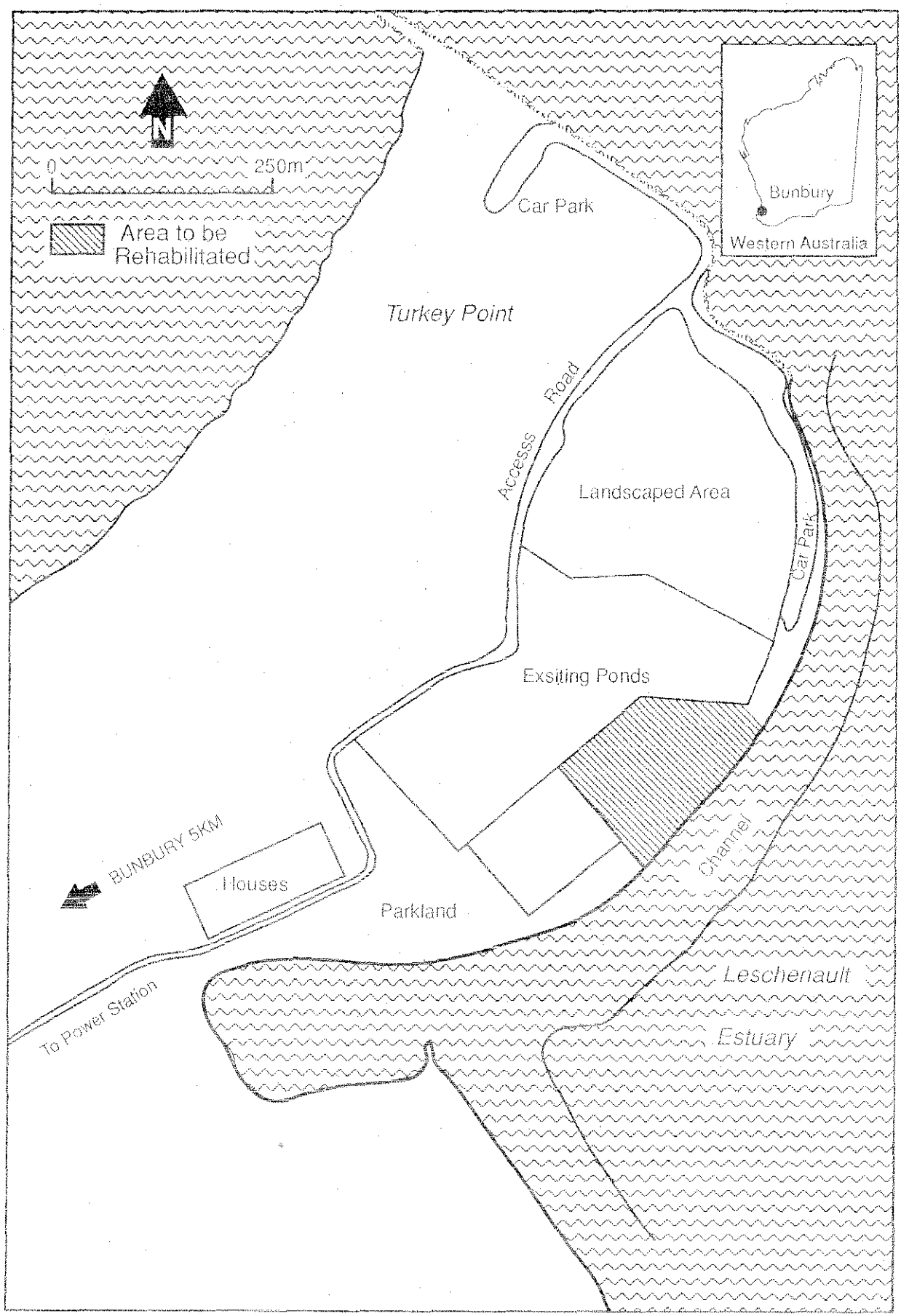

Figure 1: Location of Turkey Point wetland

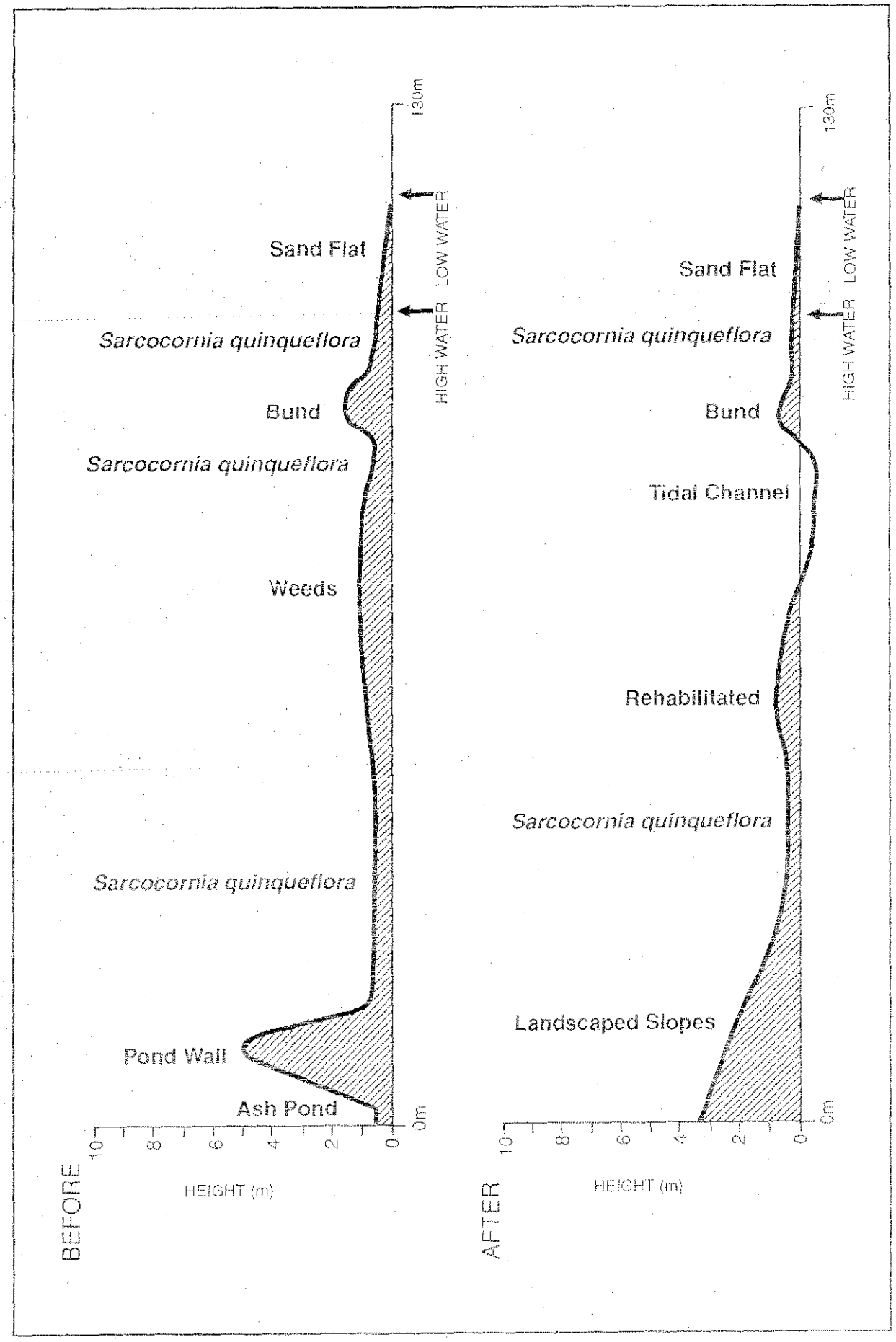

Figure 2: Typical cross section of wetland before and after rehabilitation

that the landform will be changed with the height of the existing pond walls being reduced, bank slopes reduced and a significant percentage of the total area excavated to form the permanently inundated wetland. These changes will result in a larger area of permanent wetland This gain is, however, countered by a loss in the total area of seasonally inundated wetland within the overall system.

3.2 Vegetation

With the exception of the foreshore area abutting the Leschenault Estuary, the wetland has been severely degraded by past land uses and the dredging the deep channel on the southside of Turkey Point in the 1950s. Small areas of remnant vegetation including samphire (*Sarcocornia quinqueflora*) and sedge (*Juncus kraussii*) are present. The remaining area has been invaded by weeds. The proposal will result in a large increase in plant species diversity throughout the site and provide the opportunity to effectively manage the weed infestation. A list of the plant species suitable for the site is presented in Appendix 1.

3.3 Fauna

Wetlands provide habitat for many animals including marsupials and birds. However the degraded nature of this site has reduced opportunities for fauna to survive and breed in the area. A survey of waterbird usage in 1989 indicates that the wetland is currently at the lower end of the (biological) productivity scale at Leschenault Inlet.

The establishment of a greater range of plant species and physical habitat should permit utilisation of the area by a greater number and diversity of animals. A monitoring program to determine the success of the fauna re-establishment programme is not contained in the proposal and a recommendation on this issue is contained in this report.

3.4 Conservation value

Although highly degraded, the wetland has conservation value because of the limited number of estuarine wetlands in the Bunbury region. The State and Federal governments also have an obligation to protect and enhance water fowl habitat under international agreements.

The wetland is **not** covered by the regulation nor listed in the EPA's Draft Environmental Protection Policy for Lakes on the Swan Coastal Plain as it does not currently satisfy the prescribed criteria. However if the enhancement plan was to proceed the Draft Environmental Protection Policy criteria would be satisfied. A recommendation for the wetland to be nominated for inclusion in the policy is contained in Section 6.

3.5 Leachate disposal

Fly ash contains concentrations of compounds found in coal that were not removed during the combustion process. These compounds contain (among other things) heavy metals such as chromium, lead, mercury and zinc. Soluble forms of these compounds are discharged into Leschenault Inlet in decant water coming from the holding ponds. This discharge is licensed under the Environmental Protection Act (1986) and supervised by the Leschenault Inlet Management Authority with strict controls on the volume and concentrations. While the walls and floor of the existing ponds have been lined with marl (calcium carbonate), leachate may also reach the local water table through rain water percolating through the soil profile. A recommendation on management of leachates is contained in Section 6.

SECWA does not propose that the holding ponds be lined with an impermeable material to prevent large scale movement of water and leachates from the site. Although there are presently no quantitative data on the extent of sub soil leaching, it is reasonable to assume that the proposal will result in an increase in the quantity of leachate entering the inlet and local ground water table.

It is appropriate therefore, that an investigation into leachate movement be carried out prior to further filling. If it is found that leachates are moving into the local ground water table under the existing ponds, and/or the discharge into inlet is having an adverse impact on the estuarine environment, measures should be taken to stabilize the movement and to modify the design of the new ponds appropriately. A recommendation on this issue is contained with in this report.

3.6 Mosquitoes

Pelican Point is a major breeding site for several mosquito species in the Bunbury area including *Aedes vigilax*, a known vector of the Ross River virus. It is probable that mosquitoes currently breed in the inter tidal pools of the existing wetland. The proposed water body has been designed to minimise breeding opportunities for mosquitoes by ensuring that the water body is sufficiently large and close to the estuary to be tidal. Tidal flushing of the wetland should ensure high mortality of mosquito larvae. The semi-tidal pools should also be dry during low tide and periods of low water level within the estuary ensuring there are only limited opportunities for breeding in these areas. The presence of fish and birds in the water body will further reduce the size of population.

3.7 Ongoing management

The land at Turkey Point is currently vested in the City of Bunbury and leased back to the SECWA. Under the terms of the lease the City of Bunbury has agreed to resume responsibility for the land once rehabilitation works are completed. Historically there has been a reluctance by the City of Bunbury to resume management responsibility for the wetland area already landscaped.

4. Consultation

The Environmental Protection Authority sought comment on the proposal from The City of Bunbury, The Leschenault Inlet Authority and the Conservation Council of Western Australia. The Leschenault Inlet Authority is a decision making authority and must provide approval for this development to proceed. All three organisations provided qualified support the proposal. Two issues of concern were raised. The first related to public access to the wetland after it is rehabilitated, as discussed in section 3.7. The view was expressed that access to this area should be restricted because there are adequate public recreational facilities elsewhere at Turkey Point. It was also suggested that the wetland will be of greater value to water birds if it is isolated from public access. The second issue raised related to the potential for mosquito breeding in the temporary and permanent pools. This issue is discussed in section 3.6.

5. Proponent's response and commitments

After considering the comments from the above agencies, the SECWA has agreed to modify the proposal to discourage public access to the wetland. On completion of the construction and planting programme, the area will be isolated from public access by extending the fence line to enclose the tidal pool. More trees will also be planted around the fringes of the water body to screen the site.

On the mosquito issue, SECWA has reaffirmed that the water body has been designed to reduce mosquito breeding through tidal flushing. The Commission will also introduce mullet into tidal pond to feed on the larvae and a spill-way will be constructed to retain the fish. A detailed list of SECWA's formal commitments is contained in Appendix 2.

6. Recommendations

Recommendation 1

The Environmental Protection Authority concludes that the proposal by the State Energy Commission of Western Australia to fill and rehabilitate the remaining portion of the estuarine wetland at Turkey Point Bunbury is environmentally acceptable.

The Environmental Protection Authority considers the main environmental factor requiring detailed consideration to be wetland impacts, the use of fly ash as fill, landscape design and leachate management.

The Environmental Protection Authority considers that these and other issues have been addressed by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed, subject to:

- the proponent's commitments; and
- the Environmental Protection Authority's recommendations in this report.

Recommendation 2

The Environmental Protection Authority recommends that investigations into leachate movement under the existing rehabilitated ponds and in the estuary should be carried out prior to commencement of filling. The proponent should consult with the Environmental Protection Authority on the outcome of these investigations and on any remedial action required. The Environmental Protection Authority may choose to modify the conditions of the existing discharge licence and the design of the proposed ponds as a result of these investigations.

Recommendation 3

The Environmental Protection Authority recommends that prior to commencement of filling the State Energy Commission of Western Australia should reach an agreement with the City of Bunbury on conditions and a time frame for the transfer of management responsibility back to the City of Bunbury.

Recommendation 4

The Environmental Protection Authority recommends that the State Energy Commission of Western Australia should monitor the progress in the establishment of the fauna and flora in the rehabilitated wetland and provide a detailed report to the Environmental Protection Authority prior to transferring management responsibility for the wetland to the City of Bunbury.

Recommendation 5

The Environmental Protection Authority recommends that the rehabilitated wetland should be nominated for inclusion in the Environmental Protection (Lakes) Policy 1992 when the area is revested in the City of Bunbury.

Appendix 1

Possible plant species to be established in rehabilitation area

Species
Acacia cyclops
Allocasuarina stricta
Callitris preissii preissii
Calocephalus brownii
Calothamnus quadrifidus
Casuarina glauca
Eucalyptus sp
Gastrolobium sp
Grevillea sp
Grevillea sp
Grevillea thelemanniana
Jacksonia furcellata
Melaleuca cuticularis
Melaleuca lanceolata
Melaleuca raphiophylla
Olearia axillaris
Pelargonium capitatum
Scaevola crassifolia

Appendix 2

Proponent's commitments

SECWA has made the following formal commitments with respect to the extension of fly ash ponds and enhancement of the wetland area.

1. The fly ash pond will be constructed as shown on Figure 1 of the Environmental Enhancement Plan ("The Report"). In accordance with normal design and construction procedures consistent with previous pond construction. The pond will be constructed in two parts; one to receive fly ash slurry and the other to receive decant overflow. Clean supernatart overflow from this pond will be directed to a drain which discharges to Leschenault Inlet under approved licence conditions through LIMA and EPA.
2. SECWA will ensure that minimal disturbance will occur to remnant vegetation including the low bund adjacent to the estuary and samphire foreshore, during the pond construction and enhancement stage.
3. Topsoil and surface marl that is removed will be stockpiled and later returned to those locations requiring landscaping and planting.
4. Planting of trees and shrubs as shown on Figure 6 of the plan will proceed in conjunction with advice from the City of Bunbury and LIMA so as to achieve the philosophy of enhancement as described in Part 3.3 of the Plan.
5. SECWA will construct the tidal pond as shown on Figure 8 of the Plan to ensure adequate tidal flushing.
6. Following completion of the works SECWA will monitor the pond for a possible source of mosquito breeding and will implement a control programme in conjunction with advice from the City of Bunbury.
7. SECWA will discourage public access to the wetlands by extending the fence line to enclose the tidal pool area.
8. SECWA will prepare an information board as an interpreter service to emphasise ecological relationships in the vicinity.
9. When a suitable level of rehabilitation has been agreed upon between SECWA, LIMA and the City of Bunbury the area will be resumed by the leaseholder (City of Bunbury) for future management.