# Albany Foreshore redevelopment project

## Landcorp

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 800
December 1995

## 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 report.

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 contents of the assessment report or 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
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

## CLOSING DATE

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

## Environmental Impact Assessment (EIA)

## Process Timelines in weeks

| Date | Timeline commences from receipt of full details of proposal by proponent | Time (weeks) |
|---|---|---|
| 20.2.95 | Proponent Document Released for Public Comment | |
| 17.3.95 | Public Comment Period Closed | 4 |
| 28.3.95 | Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent | 2 |
| 25.4.95 | Proponent response to the issues raised | 4 |
| 6.12.95 | EPA reported to the Minister for the Environment | 32 |

ISBN. 0 7309 5759 4
ISSN. 1030-0120
Assessment No. 898

# Contents

# Contents (cont)



## Figures

# Contents (cont)

# Executive Summary

This report provides the Environmental Protection Authority's advice to the Minister for the Environment on the environmental acceptability of the proposed Albany Foreshore Redevelopment.

The proponent, Landcorp proposes to reclaim a maximum of 3.5 hectares (ha) of Hanover Bay in Princess Royal Harbour to create a commercial and urban development along the Albany foreshore. This development involves tourist and residential accommodation, and industrial and maritime uses. As part of the development plan, it is proposed to provide services including drainage, sewerage, and connection to water mains and power. The foreshore redevelopment is part of a larger redevelopment plan for the Town of Albany. The background to the EPA's assessment of this proposal is given in Section 1 of this report.

### Recommendation 1

**The Environmental Protection Authority concludes that the general concept of the proposal by Landcorp to reclaim a portion of Princess Royal Harbour, to allow for the proposed Albany Foreshore Redevelopment to proceed is acceptable on environmental grounds.**

**However, the present developmental plan is environmentally unacceptable. It is considered that the plan could be made environmentally acceptable subject to the satisfactory implementation of the proponent's commitments and incorporation of the EPA's recommendations.**

**In reaching this conclusion the Environmental Protection Authority identified the main environmental issues requiring detailed consideration as:**

- **dredging and reclamation of a portion of Princess Royal Harbour;**
- **impact on marine flora and fauna;**
- **impact on off-shore coastal processes;**
- **impact on water quality within Princess Royal Harbour;**
- **stormwater management;**
- **soil contamination**
- **groundwater contamination;**
- **noise management;**
- **constraint to future Port development; and**
- **risks and hazards.**

### Recommendation 2

**The Environmental Protection Authority recommends that the proponent should modify and reduce the area of reclamation adjacent to the Western Precinct, to minimise damage to seagrass meadows, to the satisfaction of the Environmental Protection Authority, with advice from the Albany Waterways Management Authority.**

### Recommendation 3

**The Environmental Protection Authority recommends that the final design of the Western Precinct component of the proposed redevelopment should be undertaken so as to reduce the impact on off-shore sediment movement, in consultation with the Albany Waterways Management Authority and the Department of Transport, to the satisfaction of the Environmental Protection Authority.**

**Recommendation 4**

**The Environmental Protection Authority recommends that the suitability of the Hanrahan Road Tip site for the disposal of contaminated soils should be further investigated by the proponent with the Department of Environmental Protection to ensure that it complies with appropriate landfill criteria.**

**Recommendation 5**

**The Environmental Protection Authority recommends that the source of groundwater contamination should be identified through investigation co-ordinated by the Department of Environmental Protection prior to site development and a management plan be prepared and then implemented.**

**Recommendation 6**

**The Environmental Protection Authority recommends that the nature of the source of groundwater contamination should be determined as soon as possible, to determine the degree of contamination, and whether the rates of contamination are likely to increase.**

**Recommendation 7**

**The Environmental Protection Authority recommends that dewatering activities associated with the construction of the proposed development should be managed in such a way so as to avoid direct human contact with groundwater or direct discharge into Princess Royal Harbour, to the satisfaction of the Department of Environmental Protection.**

**Recommendation 8**

**The Environmental Protection Authority recommends that no abstraction of groundwater should take place on the proposed development site following the construction phase of the development.**

**Recommendation 9**

**The Environmental Protection Authority recommends that no structures be constructed below ground on the development site, except for building footings and normal infrastructure.**

**Recommendation 10**

**The Environmental Protection Authority recommends that the Fisheries Department and the Albany Waterways Management Authority be consulted regarding the monitoring of impacts of reclamation on water quality within Princess Royal Harbour prior to and during the construction phase of the development.**

**Recommendation 11**

**The Environmental Protection Authority recommends that consideration should be given by State Government to the likelihood that this proposal may constrain the potential growth of Albany with respect to some forms of cargo.**

**Recommendation 12**

**The Environmental Protection Authority recommends that the proponent should in consultation with the Department of Minerals and Energy, define and implement an appropriate setback distance between residential dwellings and Princess Royal Drive, to ensure that there is no risk to public safety, prior to the development of the Precinct plans, to the satisfaction of the Environmental Protection Authority.**

# 1. Introduction and Background

## 1.1 Purpose of this report

This report and recommendations provides the Environmental Protection Authority's advice to the Minister for the Environment on the environmental acceptability of the proposed Albany Foreshore Redevelopment.

## 1.2 Background

In August 1994 a proposal to redevelop land for residential, tourist and commercial usage along the Albany foreshore south of Princess Royal Drive, Albany was referred to the Environmental Protection Authority for environmental impact assessment. The foreshore redevelopment is part of a larger redevelopment plan proposed for Albany, which has the support of the Great Southern Development Commission and the Albany Town Council.

In view of the potential environmental impacts associated with the proposed reclamation, the Environmental Protection Authority determined that the appropriate level of assessment was a 'Consultative Environmental Review' (CER). Guidelines for the preparation of the CER were issued in October 1994.

A CER was subsequently prepared by ERM Mitchell and McCotter, Environmental Consultants, on behalf of the proponent, Landcorp. This PER was released for a 4 week public review period, ending on 17 March 1995. Figure 1 indicates the location of the Albany Foreshore Redevelopment site.

## 1.3 Structure of the report

This document has been divided into 7 Sections.

Section 1 describes the historical background to the proposal and its assessment, and describes the structure of this report. Section 2 briefly describes the proposal (more detail is provided in the proponent's Consultative Environmental Review). Section 3 explains the method of assessment and provides an analysis of public submissions.

Section 4 sets out the evaluation of the key environmental issues associated with the proposal. In each sub section, the objectives of the assessment is defined, the likely effect of the proposal identified, the advice to Environmental Protection Authority from submissions presented, and the proponent's response to submissions summarised. The adequacy of the response by the proponent is then considered in terms of project modifications and environmental management commitments in achieving an acceptable outcome. The Environmental Protection Authority's analysis and recommendations with respect to the identified issues are contained in this section. Where inadequacies are identified, recommendations are made to achieve the environmental assessment objectives.

Section 5 summarises the Authority's conclusions and recommendations. Section 6 describes the recommended environmental conditions. References cited in this report are provided in Section 7.

# 2. The proposal

The proposed redevelopment site is located along the Albany town centre foreshore, and is indicated in Figures 1 and 2. A structure plan for the development of the foreshore area has been prepared to guide land use and development on the Albany Foreshore, which outlines the creation of five precincts including Maritime Precinct, Town Jetty Precinct, Accommodation Precinct, Town Square Precinct and the Western Precinct. Through the implementation of this

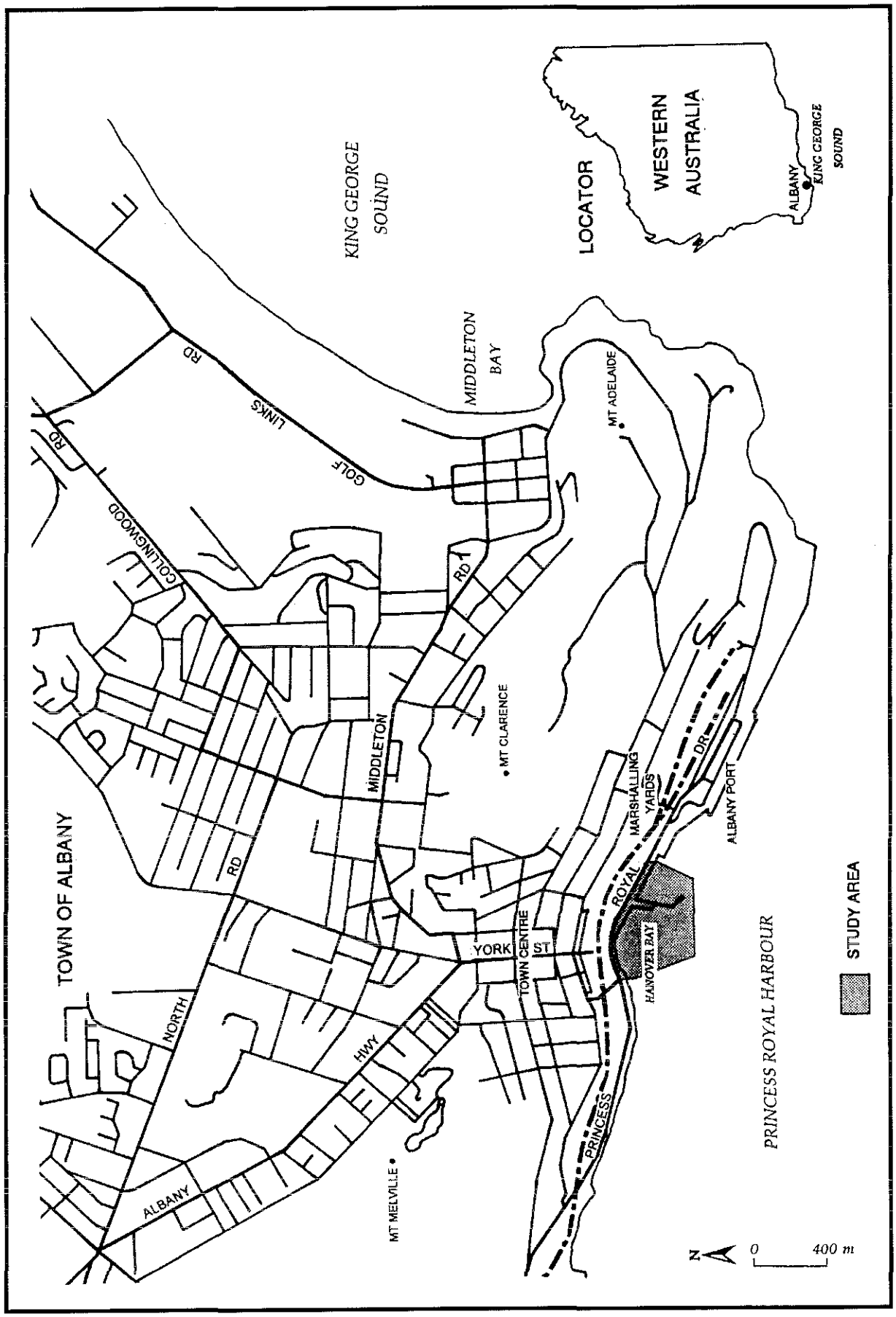



***Figure 1. Map indicating the location of Albany Foreshore Redevelopment site. (Source: Albany Foreshore Redevelopment Project CER)***

Plan, the proponent hopes to reunite the Town with the waterfront area through a range of land uses. The Plan also co-ordinates the statutory planning processes necessary to commence development.

The proposal which is subject to environmental impact assessment in this Bulletin, involves the reclamation of approximately 3.5 hectares (ha) of Princess Royal Harbour, to increase the potential land development area. This reclamation would lead to the loss of between 2.4 and 3.6 ha hectares of seagrass meadow in Princess Royal Harbour.

Figure 2 illustrates the details of the proposed development, and includes an indication of what is proposed to be established in each of the precincts.

# 3. Environmental impact assessment method

## 3.1 Steps in the procedure of assessment

The purpose of the environmental impact assessment is to determine whether a proposal is environmentally acceptable or under what conditions it could be environmentally acceptable.

A set of administrative procedures has been defined (refer to flow chart in Appendix 1) in order to implement this method of assessment.

The first step in the method is to identify the environmental issues to be considered. A list of topics (or possible issues) is identified by the Environmental Protection Authority through the preparation of guidelines which are referred to relevant agencies for comment prior to being finalised.

In the next main step these topics are considered by the proponent in the Consultative Environmental Review, both in terms of identifying potential impacts as well as making project modifications or devising environmental management strategies.

The Consultative Environmental Review is checked to ensure that each topic has been discussed in sufficient detail by the proponent prior to release for government agency and public comment. The submissions received are summarised by the Department of Environmental Protection on behalf of the Environmental Protection Authority and this process can add environmental issues which need to be evaluated in terms of the acceptability of potential environmental impact.

Proponents are invited to respond to the issues raised in submissions. Appendix 2 contains a summary of the issues raised in submissions. Appendix 3 contains the proponent's response to those issues. A list of submitters appears as Appendix 4. 12 submissions were received, of which 8 were from the local and State government agencies, 1 from organised groups, and 3 from individual members of the public.

The proponent's revised commitments following their response appears in Appendix 5.

This information, namely the Guidelines, the proponent's Consultative Environmental Review, the submissions and the proponent's response, is then subjected to analysis for environmental acceptability. For each environmental issue, an objective is defined and where appropriate an evaluation framework identified.

The expected impact of the proposal, with due consideration to the proponent's commitments to environmental management, is then evaluated against the assessment objective. The Environmental Protection Authority then determines the acceptability of the impact. Where the proposal, as defined by the proponent, has unacceptable environmental impacts, the Environmental Protection Authority can either advise the Minister for the Environment against the proposal proceeding or make recommendations to ensure the environmental acceptability of the proposal.

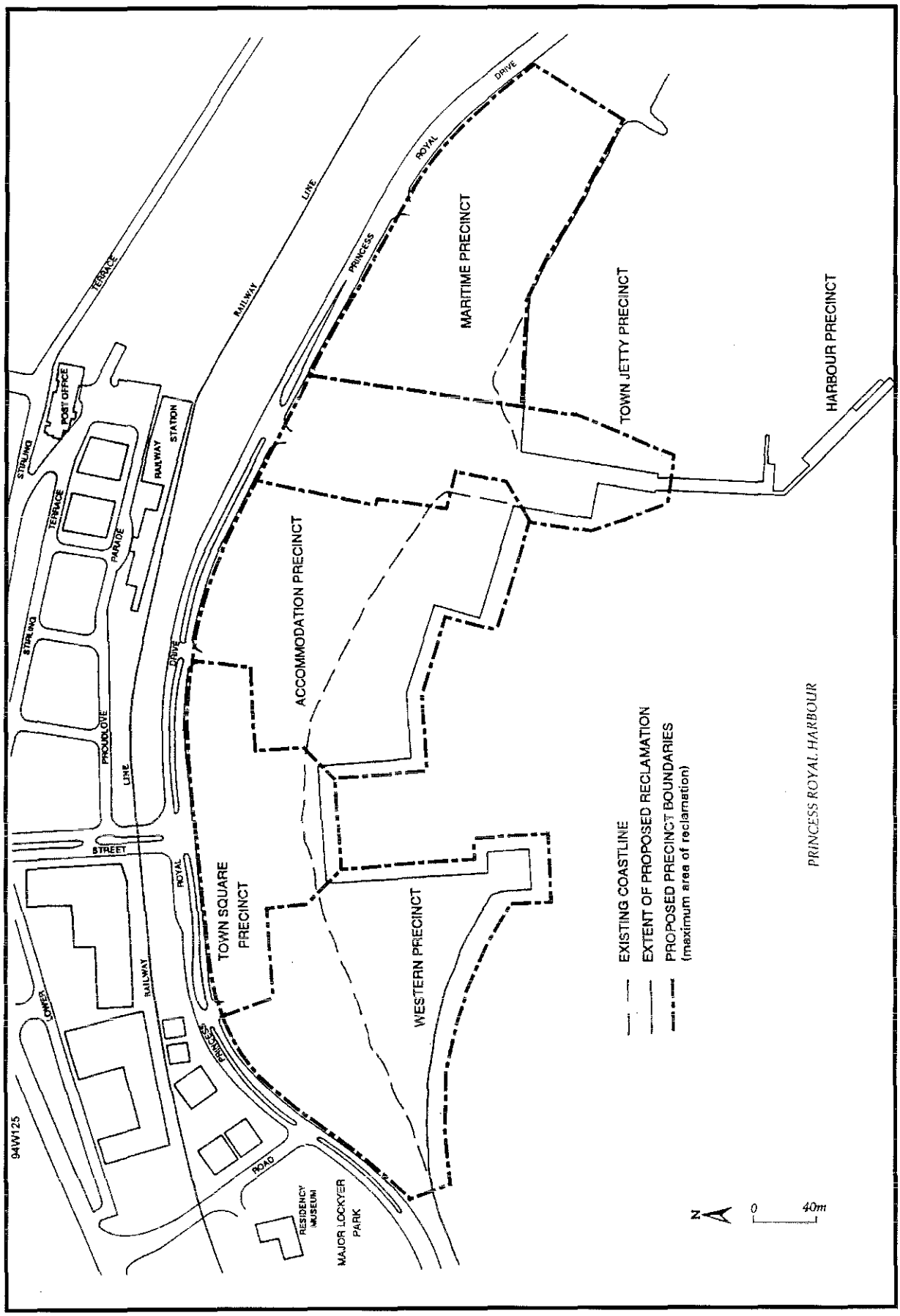



*Figure 2. Map outlining details of the Albany Foreshore Redevelopment. (Source: Albany Foreshore Redevelopment Project CER)*

*Limitation*

This evaluation has been undertaken using information currently available. The information has been provided by the proponent through preparation of the Consultative Environmental Review document (in response to guidelines issued by the Environmental Protection Authority), by Department of Environmental Protection officers utilising their own expertise and reference material, by utilising expertise and information from other State government agencies, information provided by members of the public, and by contributions from Environmental Protection Authority members.

The Environmental Protection Authority recognises that further studies and research may affect the conclusions. Accordingly, the Environmental Protection Authority considers that if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Environmental Protection Authority.

## 3.2 Public submissions

Comments were sought on the proposal from the public, community groups, as well as local and State government agencies. During the public submission period of 20 February to 17 March 1995, twelve (12) submissions were received. A summary of these submissions was forwarded to the proponent for response. The proponent received copies of the full submissions from each State Government agency.

Submissions received by the Environmental Protection Authority were within the following categories:

- 3 from individual members of the public ;
- 1 from groups and organisations; and
- 8 from State and local government agencies.

The principal topics of concern raised in public submissions included:

- stormwater management;
- disposal of contaminated soil;
- noise and traffic management;
- public risk management;
- reclamation and reclamation management;
- loss of seagrass communities as a result of reclamation; and
- potential impact of any future dredging.

The proponent's response to the submissions was also considered as part of the assessment of the proposal. This response was prepared on 6 April 1995. This is attached as Appendix 3. Additional research on issues such as contaminated soils, groundwater, and public risk has been undertaken by the proponent since that time, in response to specific requests from the EPA. This additional work is detailed within the relevant sections of this report.

## 3.3 Synopsis of public submissions

In summary, most submissions from individuals or groups received by the Environmental Protection Authority were opposed to the development as described in the CER document. Points raised in submissions opposing the proposed development include:

- stormwater management - the potential impact of the direct discharge of stormwater into Princess Royal Harbour has been an on-going problem in the vicinity of the proposed development site. Several submissions state that the stormwater should be managed

carefully to avoid sediment build up in front of the redevelopment site. It was considered that sediment tanks proposed to be used to trap sediments prior to discharge into the Harbour should be easily accessible and easy to maintain, and located carefully, in view of the high water table below the site. The suggestion was also made that a sedimentation lake be created on the site, which could provide an artificial wetland and 'strip nutrients' prior to discharge into the harbour.

- disposal of contaminated soil - concern was expressed that disposal of contaminated soil from the redevelopment site to the existing Hanrahan Road Tip site as proposed in the CER may reduce the life of the tip, and that alternative soil disposal sites should be considered.
- noise and traffic management - considerable concern was expressed regarding the potential disturbance to residents from rail operations travelling to and from the Port. This is already a problem in Albany, and the creation of a dense urban development even closer to the railway line is likely to increase this problem. Heavy vehicle traffic travelling to and from the Port along Princess Royal Drive is also likely to create noise problems, and conflict with local traffic travelling to and from the Foreshore redevelopment site.
- risk to members of the public - concern was expressed that the traffic risk to members of the public using the site analysis, as undertaken for the CER, does not cover the issue of rail traffic running parallel to the northern boundary of the site. This is likely to pose a risk to both pedestrians and cars. It was also considered unclear how pedestrians would safely traverse the road and railway line to and from the town centre to the foreshore site.
- reclamation and reclamation management - considerable concern was expressed regarding the principle of reclaiming a portion of the Harbour for residential purposes, and the extent of reclamation. It was also considered that the reclamation process should be carefully managed to ensure that sediment plumes generated by the works do not have an adverse impact on marine flora and fauna.
- loss of seagrass communities as a result of reclamation - several submissions claimed that the impact of the proposed reclamation on seagrass communities is unacceptable, particularly where seagrass meadows are known to be dense and healthy, for example adjacent to the Western Precinct. The point was made that extensive areas of seagrass meadow have already been lost in Princess Royal Harbour, and that the proposed development has the potential to directly impact on the seagrass by reclamation, and indirectly by smothering by sediment plumes during the reclamation process, or through the alteration of local hydrodynamics, which may contribute to localised scouring and subsequent loss of seagrass. In this case, the predicted loss of seagrass area as quoted within the CER are considered to be inaccurate, and underestimated The point was also made that seagrass in the vicinity is already under stress through existing land uses, e.g. polluted run-off, septic tank discharge and effluent from industrial development around the Harbour.
- potential impact of any future dredging - concern was expressed that maintenance dredging may be required at some future date, to maintain water depths. This may have an additional impact on the near-shore marine environment, and which has been ignored within the CER document.
- sewerage management - it was considered in one submission that the proponent should be required to provide emergency overflow storage with a pump station to minimise the risk of sewage overflow into Princess Royal Harbour.

Other issues such as Native Title Claim, conflict of development, status of the Town Jetty, impact on recreational use of the proposed beach, and the principle of 'privatisation of the foreshore' were also raised.

These issues have been described in detail in Appendix 2.

# 4. Evaluation of key environmental issues

The Environmental Protection Authority has considered the topics raised during the environmental impact assessment process including matters identified in public submissions. Table 1 summarises the topics raised, the comments received in order to identify issues warranting evaluation, the proponent's response to these topics, and the environmental issues evaluated within this report.

The Environmental Protection Authority has evaluated the following key environmental issues arising from this proposal, based on existing information, public submissions and advice from Government agencies:

- dredging and reclamation of a portion of Princess Royal Harbour;
- impact on marine flora and fauna;
- impact on off-shore coastal processes;
- impact on water quality within Princess Royal Harbour;
- stormwater management;
- soil contamination
- groundwater contamination;
- noise management;
- constraint to future Port development; and
- risks and hazards.

It is considered that other topics raised during the environmental impact assessment process can either be appropriately managed by the proponent in accordance with their environmental management commitments (Appendix 4), or are issues which should be dealt with by the proponent in concert with other agencies.

In giving advice regarding the environmental acceptability and management requirements for the Albany Foreshore Redevelopment, the Environmental Protection Authority has assessed the above key environmental issues.

## 4.1 Dredging and reclamation of a portion of Princess Royal Harbour

### 4.1.1 Objective

The Environmental Protection Authority's objective is to protect the environmental values of Princess Royal Harbour, in particular water quality and marine ecosystems.

### 4.1.2 Evaluation framework

Existing policy framework

Albany Harbours Environmental Study 1988 - 1989. Environmental Protection Authority Bulletins 412 and 426.

The Albany Harbours Environmental Study was prepared in 1990 for the EPA by the Albany Harbours Technical Advisory Group. Bulletins 412 and 426 summarise work undertaken during 1988 and 1989 on the state of Princess Royal and Oyster Harbours. The work focused on the environmental problems experienced within the harbours, and consisted of a number of interrelated studies that provide the technical rationale for a number of management recommendations, with the ultimate aim of identifying solutions to these environmental

**Table 1. Identification of Issues requiring Environmental Protection Authority Evaluation**

| *Biophysical issues* | | | | |
|---|---|---|---|---|
| **Topic** | **Local and State Government advice to EPA** | **Public submissions** | **Proponent's response** | **Issues** |
| Reclamation of 3.5 hectares of Hanover Bay, Princess Royal Harbour | The Albany Waterways Management Authority (AWMA) which is responsible for managing Princess Royal Harbour, advised that it does not support reclamation of the Harbour for residential purposes. The AWMA consider that the potential environmental impacts of the reclamation could be reduced if the shape of the reclaimed area were reconsidered. | There was concern expressed that the primary justification for reclamation of a portion of the Harbour is for residential land use. The view was expressed that this is not a reason to justify reclamation of the Harbour. | Reclamation is required to provide a high quality residential development in close proximity to the Harbour, to take advantage of viewlines, and create a significant water oriented feature to the south of the Town Square Precinct, when viewed from York Street. | Reclamation of a maximum of 3.5 ha for residential and commercial development which requires EPA evaluation. |
| Dredging of an area of Hanover Bay | AWMA expresses concern that proposal may inevitably lead to the need for maintenance dredging of the Harbour. | Concern was expressed that dredging maybe required to maintain adequate water depths adjacent to the new foreshore alignment, which has not been adequately addressed. An increase in demand for boating facilities in the vicinity may also occur as a result of the proposed development, which is likely to lead to an application for dredging, and should be addressed in the context of the CER. | Proponent states within the CER document that no dredging is proposed at this stage. On-going dredging to maintain water depth adjacent to the new foreshore is not expected to be required, however the proponent has undertaken a commitment that this will be monitored bi-annually for five years. | Dredging of the Harbour may have an additional impact on Harbour ecosystems and water quality which requires EPA evaluation. |
| Impact on marine flora | AWMA, Fisheries Department and Department of Environmental Protection (DEP) express concern regarding further loss of seagrass meadows in Princess Royal Harbour. | General concern was expressed regarding the loss of seagrass which will result from the reclamation. Some submissions stated that there should be no loss of seagrass at all. Other submissions expressed the view that seagrass loss should be minimised, through the redesign of the reclamation area. | The relative amount of seagrass loss is considered by the proponent to be small and given the additional environmental and community benefits of the proposal, this loss is considered to be acceptable. | Proposed reclamation will result in the loss of an area of seagrass meadow of between 2.4 to 3.6 ha which requires EPA evaluation. |

| | | | | |
|---|---|---|---|---|
| Site contamination (soil) | The Department of Environmental Protection (DEP) considers that the boundary of contaminated areas in the proposed development site should be clearly delineated by systematic soil sampling. There is also no analysis presented for heavy metals and Polycyclic Aromatic Hydrocarbons. | | Proponent has acknowledged that site investigations undertaken as part of the CER documentation do not give a clear indication of potential contamination of the development site. In response to this, the proponent has undertaken an additional sampling programme to determine the extent and nature of contaminated material on the development site. | Redevelopment site known to be contaminated as a result of previous land uses which requires EPA evaluation. |
| Site contamination (groundwater) | The DEP advises that the issue of contaminated groundwater is not addressed. The source of contamination is thought to be off site, however there is no indication of what the contamination is, or whether it is likely to get worse. Contaminated groundwater poses a risk to construction workers on the site, and future residents of the site. Further, it is unclear what impact contaminated groundwater is likely to have on the water quality within the marine environment. | | In response to concerns raised by the DEP, the proponent has undertaken additional work in relation to potential contamination of groundwater beneath the site, and additional commitments to ensure that the potential risk to construction workers and future residents is managed. A risk analysis to determine potential impact on public health of residents if groundwater was ingested was also conducted. | Groundwater beneath the development site is contaminated from an unknown, off-site source which requires EPA evaluation. |
| Sewerage management | The WAWA draws attention to the statement within the CER regarding sewage management which sates that 'if gravity flow is not possible, a second pumping station may be required. If this is the case, it was considered that the proponent should undertake a commitment to provide emergency overflow storage with a pump station to minimise risk of overflow into Princess Royal Harbour. | | The proponent has stated that a second pumping station incorporating emergency overflow storage tanks will be provided. The proponent has also undertaken a commitment to liaise with the Town of Albany to ensure that adequate sewage systems are put in place such that no sewage or waste emanating from the site enters Princess Royal Harbour. | This topic may be adequately addressed by liaison between the proponent and the WAWA and Town of Albany and does not require further evaluation by the EPA. |

| | | | | |
|---|---|---|---|---|
| Impact on marine fauna | Fisheries Department advises that reclamation will result in removal of fish habitat. | | Loss of a portion of Princess Royal Harbour is considered acceptable. | Loss of a marine habitat which will impact on fish species which requires EPA evaluation. |
| Impact on off-shore littoral drift processes | AWMA state that the shape of reclamation may have a localised impact on littoral drift processes, resulting in the accumulation of sediment at some locations.<br>DEP also advise that the shape of the reclamation may impact on off-shore littoral drift processes. | On submission expressed the view that every effort should be made to stop sedimentation associated with the construction of groynes and breakwaters, as these may cause sediment accumulation in adjacent areas. | Proponent has undertaken a commitment to design the headland to the satisfaction of the Department of Transport to prevent the movement of sand and deposition in the basin. | Impact on local water hydrodynamics and sediment movement which requires EPA evaluation. |
| ***Pollution issues*** | | | | |
| Stormwater discharge - sediment entering the Harbour may have an adverse impact on water quality. | AWMA acknowledges that the existing stormwater drainage system is unsatisfactory. Proposed stormwater discharge associated with the redevelopment should be directed away from the enclosed area south of the Town Square precinct to points east or west of the jetty.<br>DOT advises that it may be appropriate for sediment chambers to be designed to function correctly under all tidal conditions, particularly in view of groundwater levels.<br>The Town of Albany also raises concerns regarding stormwater management. | The view was expressed that the stormwater management should take into consideration maintenance issues, so that they can be easily cleaned. One submission suggested the use of a sedimentation lake, to serve as an artificial wetland which could remove sediments and add to the visual attraction of the development. | Stormwater management system is designed to prevent sediment from drain catchments via the use of baffles, litter and sediment traps, and use of sediment curtains. A 'sedimentation lake' has not been considered as part of this development, however stormwater management will be designed to the satisfaction of the Town of Albany, and DOT if they wish to be involved. | Impact on water quality within Princess Royal Harbour as a result of stormwater discharge which requires EPA evaluation. |

| | | | | |
|---|---|---|---|---|
| Turbidity associated with land reclamation | AWMA and Fisheries Department express concern regarding sediment plumes having an impact on areas away from the immediate reclamation area, especially on seagrass areas. | General concern was expressed regarding the impact of reclamation activities on water quality within Princess Royal Harbour. | Turbidity during reclamation is expected to be minimal due to installation of settlement ponds during construction phase. A fill placement programme will be developed in consultation with AWMA, which will aim to minimise turbidity and sedimentation. A number of specific and detailed commitments have also been undertaken to ensure turbidity associated with land reclamation is minimised. | Potential temporary impact on water quality within the vicinity of the reclamation site which requires EPA evaluation. |
| | | ***Social surroundings*** | | |
| Noise associated with vehicle and rail movement to and from the Port | Westrail expresses concern regarding noise associated with road and rail traffic to the Port.<br><br>Albany Port Authority is concerned that continual residential development on access roads and rail routes will stifle the Port's ability to handle increased trade.<br><br>MRD express concern that the issue of noise was only addressed in relation to noise from road traffic (not rail) in the CER.<br><br>The Town of Albany also express concern regarding impact of noise from rail operations on future residents. | General concern was expressed regarding the potential impact of noise generated from road and rail traffic on future residents of the redevelopment site. | The proponent has responded that residential buildings adjacent to Princess Royal Drive shall be designed to provide an internal noise level of 35 dB(A) from noises associated with train unloading. This would also provide acceptable internal noise levels resulting from traffic on Princess Royal Drive. A number of specific building design commitments have been provided to help ensure these standards are met. | Impact of noise from heavy vehicles and trains on future residents of the Foreshore Redevelopment site which requires EPA evaluation. |

| | | | | |
|---|---|---|---|---|
| Constraint to future port development | Albany Port Authority is concerned that continual residential development close to the perimeter of the Port, particularly on the Port's northern boundary, will stifle long term Port operations and restrict the Port's ability to react to the demands of new industries wishing to use the Port. | | The proponent acknowledges that this issue has been of key importance during the preparation of the CER. Traffic predictions prepared in consultation with the Town of Albany have been prepared and will continue to be used in designing the road infrastructure to ensure no unacceptable conflict with existing and future port access. | Proposed residential development in close proximity to existing Port operations may restrict long term plans for Port expansion which requires consideration by State Government. |
| Risks and Hazards - close proximity proposed urban development to Port of Albany | Albany Port Authority has advised that, based on the anticipated increase in cargo through the Port in the next 25 years, there is not considered to be a hazard issue.<br><br>Advice from the Explosive and Dangerous Goods Division of the DOME states that the proposed development is sufficiently far away from Port Authority Berths 1, 2, and 3 and also the fuel storage depot not to pose unacceptable risks on the accommodation precinct. It was noted that the Port does not import any explosive grade ammonium nitrate. MRD raised the point that 'right of access' to Port by heavy vehicles must be retained, as there is no alternative means of access. | | The proponent considers that a suitable buffer will be provided between the Port and the foreshore redevelopment by boat facilities and the future town marina. | Potential risk associated with the handling of hazardous cargo at the Port in view of close proximity of proposed urban development which requires EPA evaluation. |

| | | | | |
|---|---|---|---|---|
| Public risk - rail and vehicle traffic travelling to and from the Port | Westrail considers that the risk analysis conducted as part of the CER does not adequately consider the risk imposed by rail traffic running parallel with the northern boundary of the Study Area for the Foreshore Redevelopment.<br>Albany Port Authority and MRD raised concerns that the amount of traffic using the Port access road is considerable, and a pedestrian overpass or underpass is warranted.<br>MRD raises point that there is potential for conflict between tourist and residential traffic with Port related traffic.<br>Advice from the Explosive and Dangerous Goods Division of DOME states that Princess Royal Drive, which is a major access port service road, runs adjacent to the accommodation precinct. It is recommended that a separation distance of a minimum of 25 metres be adopted to the closest residence. | | The proponent acknowledges that maintaining the current port access corridor has been of key importance during the preparation of the CER. The risk presented by the amount of traffic is not considered to be significant and can be managed by an appropriate road and level crossing design e.g. pedestrians would cross the rail line via a overhead footbridge or pedestrian maze at the road vehicle level crossing. The proponent has also commissioned a study entitled 'Albany Foreshore Development Port Access Study. This is a preliminary study which examines the feasibility of' providing grade separated pedestrian / cycle access from York Street to the foreshore development, and grade separation of port related and urban traffic, and its impact on commercial access to the Port. | Road and rail traffic generated as a result of on-going Port operations is considerable, and may present a risk to public safety for pedestrians wishing to gain access to the foreshore development. This will require further consideration by the Town of Albany and the Main Roads Department. |
| Conflict of development | | Concern was expressed that the foreshore redevelopment cannot be isolated from the proposed Albany Port expansion. It was considered that all development in the area should be subject to an overall planning study before any development proceeds. | The proponent considers that this development must be viewed as separate from any other development or application relating to Princess Royal harbour. Further, other proposals may be of a completely different nature to the one described within the CER document. | This topic is not considered to be an environmental issue which requires further evaluation by the EPA. |
| Native Title Claim | | The issue of Native Title claim is not addressed in the CER document. | Initial investigations by the proponent indicate that native title is not applicable in this location. | This topic is not considered to be an environmental issue which requires further evaluation by the EPA. |

| | | | | |
|---|---|---|---|---|
| Impact on Town Jetty | | Concern was expressed that the jetty should not be replaced by a breakwater as it would detract from the tourism and heritage value of the area. | The proponent has responded that there are no plans to replace the jetty with a breakwater. If this were to occur in the future, it would be subject to a separate environmental assessment. | This topic is not considered to be an environmental issue which requires further evaluation by the EPA. |
| Privatisation of the foreshore | | Public access to the Albany foreshore should not be restricted as a result of private development along the foreshore. | The proponent has stated that all foreshore areas within the proposed development are designated as Public Open Space areas, allowing uninterrupted public access to all foreshore areas. | This topic is not considered to be an environmental issue which requires further evaluation by the EPA. |
| Impact on recreational use of the foreshore | | Concern was expressed that residential development at the western extremity of the project site may impinge upon the recreational use of the proposed beach. | The proponent has stated that full details of the proposed beach in the Western precinct are not known at this stage, however residential development adjacent to the western extremity of the site has been redesigned since preparation of the CER, to remove any conflict between the residential area and the beach. | This topic is not considered to be an environmental issue which requires further evaluation by the EPA. |

problems. Studies undertaken included seagrass mapping, an inventory of the major sources and types of pollutants entering the harbours, water circulation patterns, and an assessment of nutrient stores accumulated in the waters, sediments and plants. The work concluded that seagrass communities have declined, and that the waters within the harbours are enriched with nutrients. This has resulted in the accumulation of macroalgae within the harbours and a further decline of seagrass communities. One major recommendation was the formation of a management organisation to provide an on-site co-ordinating role for management of the harbours and their associated waterways.

*Draft Albany Waterways Management Programme. Albany Waterways Commission Report No. 45, 1994.*

This programme was drafted to provide strategies and actions required to address the issues facing the Albany waterways, with the overall aim of improving and maintaining the ecological health of the Albany harbours. The programme was prepared under Section 35 of the Waterways Conservation Act, to provide direction for the Albany Waterways Management Authority (AWMA). This Authority was established in 1991 to take on an on-site management role, to co-ordinate the implementation of recommendations made by the EPA in EPA Bulletins 412 and 426, and to take responsibility for the overall management of the waterways.

The programme is designed to guide the AWMA's operations, and to provide direction for other organisations, agencies and groups in waterways management.

Comments from key Government agencies

The AWMA advises that it would not normally support the reclamation of the Harbour for residential purposes. However, it is recognised that the overall project provides considerable public opportunities and improves the public use and enjoyment of the foreshore at this location. In this regard, it is supportive of the proposal. However, the AWMA consider that the potential environmental impacts of the reclamation, such as loss of seagrass, could be reduced if the shape of the reclamation is reconsidered, for example a uniform extension into the Harbour. The shape of the Western Precinct is of particular concern to the AWMA, given its extension into the Harbour.

AWMA also express concern that proposal may inevitably lead to the need for maintenance dredging of the Harbour, particularly as there may be a demand to boat access to the new hard walled foreshore edge, and eventually possibly a marina. In this context, concern was expressed that there is no mention of average water depths adjacent to the realigned foreshore.

### 4.1.3 Response from the proponent

The proponent has reiterated that the proposal has been designed in its current shape to take advantage of several important viewlines in the area and to create a Basin to the south of the Town Square Precinct. The Basin has been designed to create a significant water feature. It is therefore not considered possible to reconsider the shape of the reclamation.

The proponent states within the CER document that no dredging is proposed at this stage. This is re-iterated in the proponent's commitments (Commitment 1.5.1, Appendix 5).

On-going dredging to maintain water depth adjacent to the new foreshore is not expected to be required, however the proponent has undertaken a commitment that this will be monitored bi-annually for five years (Commitment 1.4.4, Appendix 5).

### 4.1.4 Evaluation

In evaluating this proposal, the EPA has noted the conclusions of previous studies on seagrass and water quality within Princess Royal Harbour, undertaken by the EPA between 1988 and 1989 (Albany Harbours Environmental Study, EPA Bulletins 412 and 426). These studies have

concluded that there has been an overall decline in the area of seagrass meadow in the Harbour, and an increase in nutrient levels in waters within the Harbour. This loss of seagrass and decline in water quality is considered to have occurred as a result of land use activities on land surrounding the Harbour, and in the water catchment areas of river systems which discharge into the Harbour.

The EPA considers that any dredging of the Harbour is likely to have an additional impact on marine ecosystems and water quality within the Harbour. The proponent's commitment that no dredging will be undertaken at this time is noted, and that if any dredging is proposed at some future date, it shall be referred to the EPA for environmental impact assessment. This commitment is considered to adequately address the issue of dredging.

However, the EPA notes that the reclamation of a maximum area of 3.5 hectares of Princess Royal Harbour is proposed to maximise the area to be developed for residential and commercial use. This reclamation is also planned to take advantage of viewlines, and create a significant water-oriented feature to the south of the Town Square Precinct, when viewed from York Street.

While acknowledging the principle that waterways should not be reclaimed for residential purposes, the EPA has concluded that some reclamation is environmentally acceptable as the area does not support a significant population of marine flora or fauna (with the exception of seagrasses - see Section 4.2 of this report), it is proposed to be used for public purposes, the foreshore in the vicinity has already been extensively modified, and it is a relatively small area when compared to the entire harbour area.

Accordingly, the EPA has concluded that some of the proposed reclamation of Princess Royal Harbour is environmentally acceptable.

## 4.2 Impact on marine flora and fauna

### 4.2.1 Objective

The Environmental Protection Authority's objective is to protect marine flora and fauna from adverse environmental impacts.

### 4.2.2 Evaluation framework

Existing policy framework

*Albany Harbours Environmental Study 1988 - 1989. Environmental Protection Authority Bulletins 412 and 426.*

The Albany Harbours Environmental Study was prepared in 1990 for the EPA by the Albany Harbours Technical Advisory Group. Bulletins 412 and 426 summarise work undertaken during 1988 and 1989 on the state of Princess Royal and Oyster Harbours. The work focused on the environmental problems experienced within the harbours, and consisted of a number of interrelated studies that provide the technical rationale for a number of management recommendations, with the ultimate aim of identifying solutions to these environmental problems. Studies undertaken included seagrass mapping. The work concluded that seagrass communities have declined, and that the waters within the harbours are enriched with nutrients. This has resulted in the accumulation of macroalgae within the harbours and a further decline of seagrass communities. One major recommendation was the formation of a management organisation to provide an on-site co-ordinating role for management of the harbours and their associated waterways.

*Draft Albany Waterways Management Programme. Albany Waterways Commission Report No. 45, 1994.*

This programme was drafted to provide strategies and actions required to address the issues facing the Albany waterways, with the overall aim of improving and maintaining the ecological health of the Albany harbours. The programme was prepared under Section 35 of the Waterways Conservation Act, to provide direction for the Albany Waterways Management Authority (AWMA). This Authority was established in 1991 to take on an on-site management role, to co-ordinate the implementation of recommendations made by the EPA in EPA Bulletins 412 and 426, and to take responsibility for the overall management of the waterways.

The programme is designed to guide the AWMA's operations, and to provide direction for other organisations, agencies and groups in waterways management.

Technical Information

*Albany Foreshore Redevelopment CER - Sections 3.3 and 4.2*

Section 3.3 gives a description of the existing marine environment in the vicinity of the proposed development area and includes a discussion of water quality and water circulation, sea floor and marine flora and fauna characteristics, the significance of seagrass and impacts of nutrients on seagrass communities.

Section 4.2 describes the potential environmental impacts of the proposed development on seagrass beds and marine fauna.

Comments from key Government agencies

The Fisheries Department advised that reclamation will result in the loss of fish habitat, however this loss is not expected to have a 'discernible' effect on fish resources within the Harbour.

The Fisheries Department also expressed concern regarding the loss of seagrass meadows in Princess Royal Harbour as a result of the proposed reclamation. It was suggested that the cumulative loss of seagrass in Princess Royal Harbour needs to be considered, and that further loss is unacceptable. The suggestion was made that the redevelopment plan be reviewed to try to avoid seagrass loss. Turbidity arising from any reclamation should also be carefully managed during the construction phase. It was suggested that turbidity plumes could be controlled by the use of stone bunding and fine nets to trap sediment movement.

The AWMA and the Department of Environmental Protection (DEP) expressed concern regarding loss of seagrass meadows in Princess Royal Harbour, which would result from the reclamation, particularly in the vicinity of the Western precinct. Seagrass loss is considered to be a significant issue, and loss should be minimised where possible. It was suggested that the proponent acknowledge the true cost of reclamation by contributing towards seagrass recovery in the rest of the Harbour. The AWMA also state that turbidity arising from any reclamation should be carefully managed during the construction phase, to reduce potential impacts on seagrass and other biota. The AWMA also suggested that turbidity plumes should be controlled by the use of stone bunding (as opposed to earth or limestone) and fine nets to trap sediment movement. It was considered that the use of earth or limestone bunds may not be as effective as stone, as they do not guarantee that the transportation of sediment will not occur.

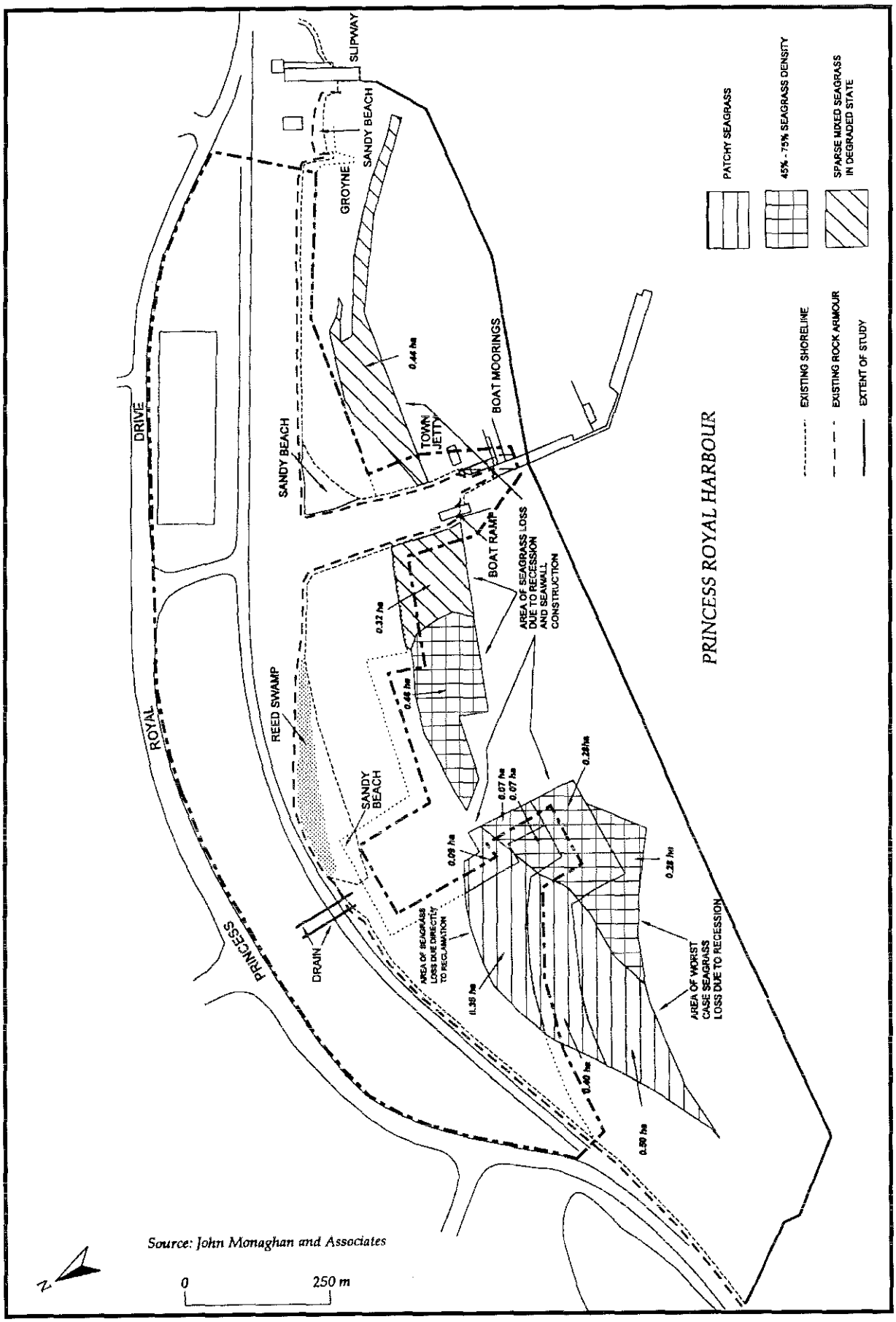



*Figure 3. Map indicating the extent of seagrass which would be affected by the proposed reclamation. (Source: Albany Foreshore Redevelopment Project CER)*

### 4.2.3 Response from the proponent

The proponent has re-iterated that the relative amount of seagrass loss is small, and given the additional environmental and community benefits of the proposal, believes that the loss is acceptable. Environmental benefits of the proposal are considered by the proponent to be :

- the removal of contaminated soil which may otherwise pollute the harbour through leaching; and
- treatment by sedimentation of stormwater which is currently untreated.

It is also re-iterated that in a 'worst case scenario', the greatest loss of seagrass would be 3.36 ha. In the 'best case' scenario', a loss of 2.48 hectares could be expected. These figures include direct loss as a result of reclamation, and seagrass recession.

The proponent has also committed to undertake a number of measures to avoid turbidity and sedimentation during the reclamation process, to avoid additional disturbance to seagrass communities. These include commitments to :

- use cohesionless granular fill material with minimum silt, clay and organic fraction and little or no nutrients during the reclamation process (Commitment 1.3.1, Appendix 5);
- attempt to confine filling operations to autumn, winter and spring months (i.e. March through to November) to avoid critical periods for seagrass growth. Where this cannot be achieved sediment curtains will be used to minimise the impacts of turbidity on seagrass meadows (Commitment 1.3.2, Appendix 5);
- ensure the placement of fill material is planned and carried out in a manner that causes any turbid water to be directed away from seagrass areas, to the satisfaction of AWMA. Discharge water which requires pumping from reclaimed areas will be directed to a settlement pond or another reclamation fill area to allow it to settle before flowing into the Harbour (Commitment 1.3.3, Appendix 5);
- confine temporary filling for seawall construction to only that necessary to allow work to be completed (Commitment 1.3.4, Appendix 5);
- ensure excavated sediments for seawalls, where it could contain organic matter, nutrients, or fine clay or silt fractions, are disposed of at the Hanrahan Road refuse site or other suitable location (Commitment 1.3.5, Appendix 5); and
- undertake monitoring of the areas of seagrass affected, to monitor and observe whether the area affected by dredging is greater than predicted, record changes through annual mapping using aerial photographs, and dive survey checking of selected transects annually for a period of five years after construction commences. This monitoring shall be carried out to the satisfaction of the DEP and results shall be reported to and discussed with AWMA on an annual basis (Commitment 1.3.9, Appendix 5);

### 4.2.4 Evaluation

Marine flora

The EPA acknowledges the important role provided by seagrass communities in the overall health of the marine ecosystem within the Princess Royal Harbour. It is also aware of the extensive loss of seagrass in the Harbour and build up of attached and unattached algae, which is a symptom of a polluted waterbody, detected since studies of the Harbour first commenced in the mid 1970's (EPA, 1990). Research undertaken in Princess Royal and Oyster Harbour indicates that approximately 80 % of the original seagrass meadows has been lost, principally as a result of pollution of the water bodies (State of the Environment Report, 1992 : 50).

The EPA notes that the reclamation as proposed in the CER document will result in the direct loss of an area of between 2.4 to 3.6 hectares of seagrass meadow. This equates to an additional loss of approximately 2 % of the remaining seagrass in Princess Royal Harbour. The EPA's preferred position is that there should be no further net loss of seagrass in Princess Royal Harbour. However it is acknowledged that some loss of seagrass is inevitable if the

proposed redevelopment of the Albany foreshore area proceeds. The EPA has therefore reconsidered this position for this proposal only, and considers that seagrass loss should be reduced as much as possible.

The EPA has reviewed carefully the information provided within the CER document on the area of seagrass meadow proposed to be impacted by the reclamation. This information is reproduced in Figure 3, and indicates that the proposed reclamation is likely to impact on portions of 'patchy' and 'degraded' seagrass meadow. However, the reclamation may also impact on seagrass meadows which are considered to be dense, i.e. which have a cover of between 45 and 75 %, adjacent to the proposed Western Precinct. The EPA considers that impact on areas known to be covered by dense stands of seagrass should be avoided.

The EPA also notes that the proponent has undertaken a commitment to confine filling operations associated with the reclamation process to autumn, winter and spring to avoid critical growth periods for seagrass.

**The EPA recommends that the proponent be required to modify and reduce the extent of the proposed reclamation adjacent to the Western Precinct, to reduce loss of seagrass meadows, to the satisfaction of the EPA, with advice from the AWMA.** (Recommendation 2).

Marine fauna

The loss of a marine habitat as a result of proposed reclamation will also result in the removal of fish habitat.

The EPA notes that there will be some loss of marine faunal habitat, however this is considered to be acceptable, provided seagrass loss is minimised.

## 4.3 Impact on off-shore coastal processes

### 4.3.1 Objective

The Environmental Protection Authority's objective is to ensure that the proposed development does not have a significant impact on existing coastal processes, particularly off-shore sediment movement.

### 4.3.2 Evaluation framework

Technical information

*Albany Foreshore Redevelopment CER - Section 4.3*

Section 4.3 of the CER describes the potential impact of the proposed reclamation on existing coastal processes in the vicinity of the development site, and describes management measures proposed to be implemented to ensure that these impacts are minimised.

Comments from key Government agencies

The AWMA considers that the shape of reclamation may have a localised impact on littoral drift processes, resulting in the accumulation of sediment at some locations. For example, it was considered that the provision of a Basin in front of the Town Square Precinct will encourage the retention of sediment (deposited by stormwater and possibly shoreline drift) and litter.

The AWMA also considers that the proposed establishment of a beach near the Western Precinct has not been adequately addressed and requires more detail, for example exact location, dimensions, method of construction, source material and maintenance.

The DEP also advise that the size and shape of the proposed reclamation, particularly in the vicinity of the Western Precinct, is likely to interrupt existing sediment movement along the foreshore, and may lead to sediment (sand) accumulation at some locations.

### 4.3.3 Response from the proponent

In response to concerns raised in submissions, the proponent has undertaken the following commitments :

- ensure that the headland on the Western Precinct is of sufficient size and appropriate design to minimise sand movement in an easterly direction and being deposited on the eastern side of the this new breakwater, to the satisfaction of the Department of Transport (Commitment 1.4.1, Appendix 5); and
- ensure that predominantly washed beach sand with a coarse particle size is used to construct the beach on the Western Precinct (Commitment 1.4.2, Appendix 5);
- liaison with the Town of Albany to ensure that the proposed drainage outlet to the west of the town jetty breakwater is relocated to the eastern side to maximise sediment disposal dispersal and to minimise sediment build up in the embayment area (Commitment 1.4.3, Appendix 5). This will help to ensure that any sediment originating from the drainage outlet does not accumulate in the vicinity of the accommodation Precinct and Town Square Precinct.

The proponent has also reiterated that the stormwater management system will be designed to discharge into the embayment in front of (to the south of) the Town Square Precinct. Baffles, litter traps and sedimentation traps will be put in place, which will prevent sediment entering the Harbour and accumulating in the proposed Basin area in front of the Town Square Precinct.

### 4.3.4 Evaluation

The EPA has noted that the design of the reclaimed area proposed as part of the redevelopment in the CER document protrudes at an angle away from the existing foreshore alignment, particularly in the vicinity of the Western Precinct, and is therefore likely to interrupt existing sediment movement.

The EPA also notes that the proponent has undertaken a commitment to design the headland to the satisfaction of the Department of Transport to prevent the movement of sand and deposition in the basin. It is acknowledged by the EPA that as a result of recommendations contained within this report in relation to potential impacts on seagrass communities, the design of the proposed reclamation area would need to be modified by the proponent so as to avoid disturbance to seagrass.

The EPA considers that the final design of Western Precinct has the potential to have an impact on sediment dynamics in the vicinity of Hanover Bay.

**The EPA recommends that the final design of the Western Precinct component of the proposed redevelopment should undertaken so as to reduce the potential impact on off-shore sediment movement in consultation with the AWMA and DOT, to the satisfaction of the EPA.** (Recommendation 3)

## 4.4 Stormwater management

### 4.4.1 Objective

The Environmental Protection Authority's objective is to ensure that water quality within Princess Royal Harbour is maintained to an acceptable standard.

### 4.4.2 Evaluation framework

Existing policy framework

*'National Water Quality Management Strategy - Australian Water Quality Guidelines for Fresh and Marine Waters' Australia and New Zealand Environment and Conservation Council (1992)*

This document identifies acceptable standards for water discharge to ensure that the ecological values of aquatic ecosystems are protected. In the context of this assessment, these standards would also apply to groundwater discharging into the marina and near-shore marine environment which may have been contaminated as a result of previous land use activities.

Technical information

*Albany Harbours Environmental Study 1988 - 1989. Environmental Protection Authority Bulletins 412 and 426.*

The Albany Harbours Environmental Study was prepared in 1990 for the EPA by the Albany Harbours Technical Advisory Group. Bulletins 412 and 426 summarise work undertaken during 1988 and 1989 on the state of Princess Royal and Oyster Harbours. Work undertaken as part of this study indicates that urban run-off into Princess Royal Harbour and Oyster Harbour contained significant quantities of nitrogen and phosphorus, which was presumed to originate from garden fertilisers. Urban run-off was also found to contain significant bacterial loads and low concentrations of heavy metals and pesticides.

*Albany Foreshore Redevelopment CER*

The CER document describes in detail proposed stormwater management for the site. In summary, it is proposed to minimise the release of stormwater which contains sediments directly into the redevelopment area. This is proposed to be achieved through the use of baffles, litter traps and sedimentation pits located beneath the main drains in the Town Square Precinct and at the drainage outlet currently located near the town jetty. Detailed designs of the litter traps and sediment pits were included within the CER document.

Comments from key Government agencies

The Department of Transport advised that the design of the stormwater drainage systems as described within the CER document should be reviewed based on existing groundwater levels and tidal ranges to ensure that drainage sedimentation chambers function correctly under all conditions, and that the existing groundwater table is not raised to unacceptably high levels.

The AWMA acknowledged that the existing situation in relation to stormwater management being discharged directly into the harbour is unacceptable. The Authority endorses the proponent's approach to stormwater management, and considers that structures should be designed to ensure easy maintenance. The Authority considers that stormwater discharged should be directed away from the enclosed area south of the Town Square precinct to points east or west of the jetty.

### 4.4.3 Response from the proponent

The proponent has provided details of the proposed stormwater management strategy within the CER document.

The following commitments have also been made by the proponent :

- liaison with the Town of Albany to ensure that baffles are built at all drainage outlet points to act as velocity attenuators and traps in the case of an upgradient fuel spill. The design of the baffle system will be discussed informally by the construction engineers and the Town

of Albany, and implemented to the satisfaction of the Town of Albany (Commitment 1.5.4, and 1.5.8, Appendix 5);

- all sediment and litter traps are constructed as part of the Town Square Precinct. This will be done to the satisfaction of the Town of Albany to ensure that adequate access is provided for maintenance on a regular basis (Commitment 1.5.5, 1.5.8 and 1.5.11, Appendix 5);
- liaison with the Town of Albany to establish a monitoring programme of the water quality of the embayment and all drain outlets through quarterly visual assessments and water sampling for a period of three years, with biannual reports of results to the AWMA and the DEP (Commitment 1.5.12, and 1.5.13, Appendix 5).

### 4.4.4 Evaluation

The EPA acknowledges that stormwater run-off from land adjacent to the Harbour has the potential to have an adverse impact on water quality within Princess Royal Harbour, principally through the sediment in suspension and nutrients, pesticides and polluted road run-off. This potential impact on water quality from polluted stormwater run-off has already previously been recognised by the EPA, and was acknowledged in the Albany Harbours Environmental Study (EPA Bulletin 412).

Stormwater run-off from land in the vicinity of the development area is currently discharged directly into the Harbour. The EPA recognises that the implementation of this proposal would improve this existing situation by constructing stormwater retention basins, to help to reduce pollutants entering the Harbour. Further, the proponent proposes to construct sediment and litter traps, and baffles to reduce the velocity of water flow and so help to reduce the discharge of sediments in suspension into the Harbour.

The EPA considers that the stormwater retention basins should be designed carefully and in detail to ensure that they are effective in controlling direct stormwater discharge into the Harbour, particularly in view of the fact that the groundwater is quite close to the surface in this area. It is also considered important that the retention basins, sediment and litter traps are easily accessible so that they can be cleaned and maintained on a regular basis.

The EPA notes the proponent's commitments in relation to stormwater management, and has concluded that this issue could be appropriately managed by the proponent through the implementation of the commitments, in consultation with the Albany Waterways Management Authority, the Town of Albany and the Department of Transport.

## 4.5 Soil contamination

### 4.5.1 Objective

The Environmental Protection Authority's objective is to ensure that contaminated soil does not have an adverse impact on people living near or visiting the site nor have an adverse effect upon the environment.

### 4.5.2 Evaluation framework

Existing policy framework

*Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council (1992) Australian and New Zealand Guidelines for the assessment and management of contaminated sites.*

This document is intended to provide technical guidelines to provide a framework for the assessment and management of contaminated sites in Australia and New Zealand. It provides specific guidance on identification, assessment and clean up measures, and includes environmental soil quality guidelines.

Technical information

*Wood and Grieve Engineers (1994) Geotechnical and Site Contamination Investigation - Albany Foreshore Precinct*

Information contained within this report was presented within the CER document. The report identified three areas within the proposed development area which may contain contaminated soils, and soils which are considered to be unsuitable for development, and which may require removal prior to development proceeding. These areas are indicated in Figure 4 of this assessment report.

*ERM Mitchell McCotter (1995) Albany Foreshore Site Assessment*

This report was commissioned by the proponent in response to specific concerns raised by the EPA during its assessment of this proposal. The document provides information on the development site history and prior land use, site investigation procedures to determine the location and extent of contaminated soils and groundwater, and presents the results and an analysis of this information.

In summary, key conclusions of this report in relation to soil contamination were :

- concentrations of the parameters analysed in the soil samples (19) showed a few cases of minor exceedence above the stipulated ANZECC 'B' levels. All exceedances were identified in soil pockets already prescribed for removal for engineering reasons; and
- it is proposed to remove and deposit contaminated soils at a suitable site, possibly at the Hanrahan Road rubbish tip. As concentration levels found in the soils were considered to be low, this action is proposed to take place without any form of treatment.

Comments from key Government agencies

The Department of Environmental Protection considered that the issue of contaminated sites was inadequately addressed within the CER document. Additional information is required before a thorough assessment of the environmental implications of the proposed development could be undertaken by the EPA. Additional work required included a thorough sampling programme to clearly define the location and extent of the contaminated areas within the development site, and the nature of contaminated material present.

The Town of Albany expressed concern that the disposal of contaminated material at the Hanrahan Refuse site, as proposed in the CER may reduce the life of the site. It also raised concern regarding the impact of noise from on-going rail operations on future residents of the foreshore development, and stormwater management issues.

### 4.5.3 Response from the proponent

The proponent identified the approximate locations of areas within the proposed development site which were likely to contain contaminated soils within the CER document. A commitment was undertaken to remove any contaminated soils, and to deposit this material at the Hanrahan Road refuse site.

In response to specific concerns raised by the EPA during the assessment of this proposal, the proponent commissioned an additional study to determine the exact location, extent and nature of contaminated soils on site. This information is presented in the 'Albany Foreshore Site Assessment ' Report, forwarded to the DEP for consideration on 13 September 1995. In summary, this report concluded that analysis of soil samples showed only a few cases of minor exceedences of polyaromatic hydrocarbons (PAH's), metals and dieldrin above stipulated Australian and New Zealand Environment and Conservation Council (ANZECC) 'B' levels. These exceedences were considered to be minor and are located in soil pockets which are


*Figure 4. Map indicating the locaton of contaminated soils recommended for removal at the Albany Foreshore Redevelopment site. (Source: Albany Foreshore Redevelopment Project CER)*

already proposed to be removed for engineering reasons as part of the site development. Accordingly, no additional investigation, remediation or treatment of these contaminated areas has been proposed by the proponent.

A commitment to remove the contaminated material and replace it with 'clean fill', to the satisfaction of the Town of Albany, has been undertaken by the proponent (Commitment 1.2.2, Appendix 5). The existing Hanrahan Road tip site was identified by the proponent in the CER document as a possible site for the disposal of contaminated soils.

### 4.5.4 Evaluation

The EPA is aware that a portion of the redevelopment site has previously been used as a railway marshalling yard, and as a land fill site. Fuel storage drums have also been stockpiled in the past on some areas on the site. As a consequence of these uses, it is possible that toxic or contaminating materials may have been loaded or unloaded in the vicinity which, if spilt, may have contaminated soils, particularly in the vicinity of the railway marshalling yard. Groundwater levels are also known to be high in the vicinity of the foreshore, and the potential therefore exists for groundwater to be polluted. Both contaminated soils and polluted groundwater may result in a public health risk if the proposed urban development at the site were allowed to proceed.

The CER identifies some areas of contaminated soils, located in areas referred to as Area 'A', 'B', and 'C'. These areas are indicated on Figure 4. However, the exact location, extent and nature of contaminated material present at the site was not detailed within the CER document. The EPA also notes that a commitment is made to remove any unacceptably contaminated soils.

The EPA considered that additional information was required regarding the location, extent and nature of contaminated material present on the site before a thorough assessment of the environmental acceptability of the proposed redevelopment could take place. Accordingly, the proponent was requested to forward this additional information.

Additional information as requested was subsequently forwarded by the proponent to the DEP on 20 July 1995. Figure 5 indicates the location of boreholes used to take soil samples to test the extent of soil contamination at the redevelopment site. The results of soil contamination tests undertaken for the site are included in Table 2. Table 3 includes details of the assessment criteria used to determine whether the soils are contaminated. In summary, this information confirmed that soils found on site in Areas A, B and C were contaminated, however all contaminated soil found had already been designated for removal as part of the proposed redevelopment.

The EPA considered this additional information, and concluded that the issue of contaminated soils could be adequately managed by removal of the soils off-site. The EPA also notes the proponent's commitment to dispose of the contaminated material and replace it with 'clean fill', to the satisfaction of the Town of Albany.

In view of the contaminated nature of the soils, the EPA considers that the existing Hanrahan Road Refuse Site at Albany may not be suitable for the disposal of this material. Accordingly, **the EPA recommends that the suitability of the Hanrahan Road Tip site for the disposal of contaminated soils should be further investigated by the proponent with the Department of Environmental Protection to ensure that is complies with appropriate land fill criteria**.(Recommendation 4)

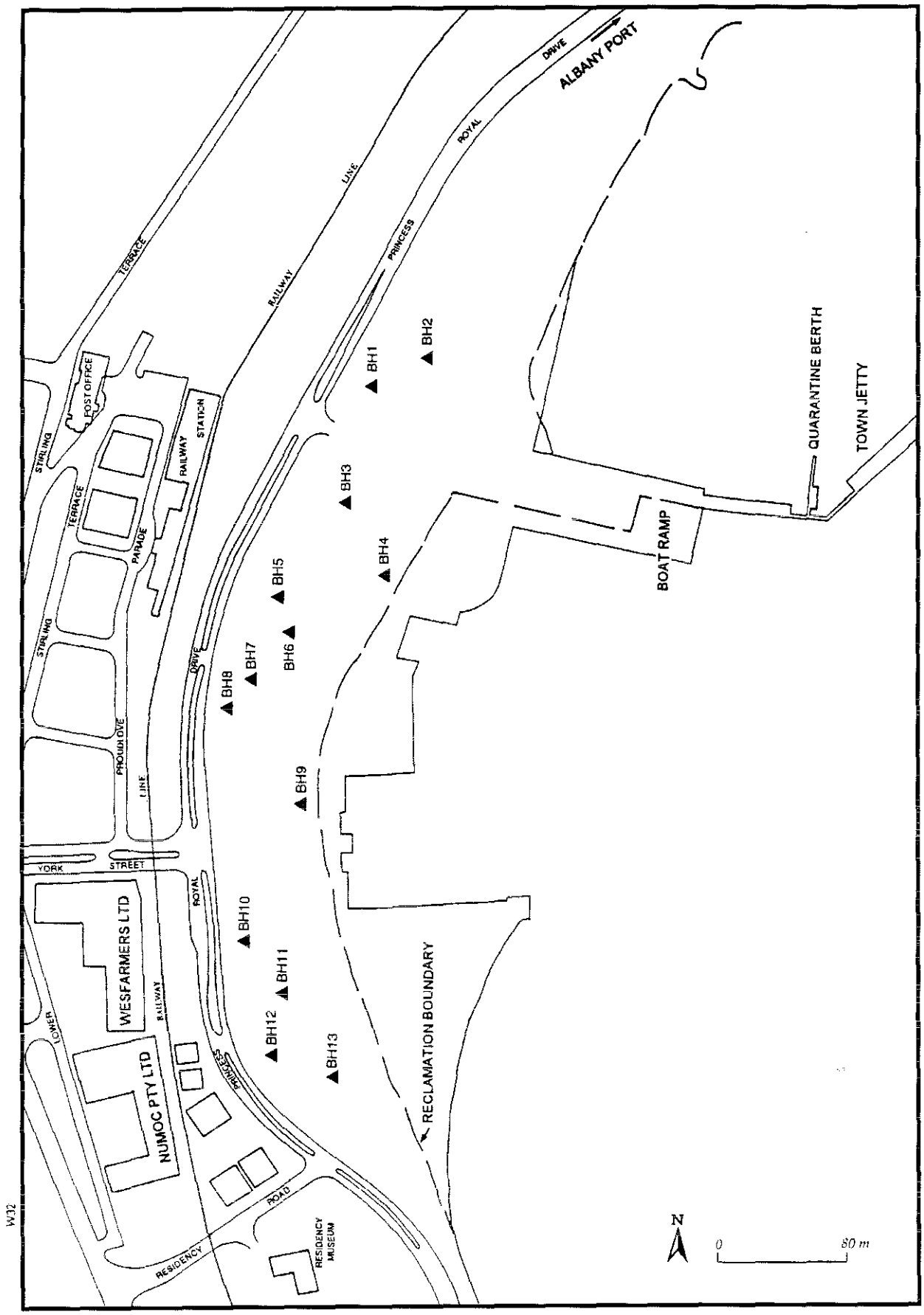



*Figure 5. Map indicating the location of boreholes for soil contamination tests at the Albany Foreshore Redevelopment site. (Source: Albany Foreshore Site Assessment)*

**Table 2. Analytical results of soils sampled at the Albany Foreshore Redevelopment site. (Source: Albany Foreshore Site Assessment)**

| Parameter/Borehole | BH1 | BH2 | BH3 | BH4 | BH5 | BH6 | BH7 | BH8 | BH9 | BH10 | BH11 | BH12 | BH13 | MW1 | MW2 | MW3 | MW4 | MW5 | MW6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated Biphenyls (PCBs) (mg/kg) | ND | ND | - | - | ND | ND | ND | ND | - | ND | - | - | - | - | - | ND | ND | ND | - |
| Organochlorine Pesticides (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Aldrien | 0.06 | - | - | - | ND | ND | ND | ND | - | ND | - | - | - | - | - | ND | ND | ND | - |
| Dieldrin | 0.36' | 0.05 | - | - | - | ND | ND | 0.39' | - | ND | - | - | - | - | - | ND | ND | ND | - |
| PP'-DDE | - | - | - | - | - | ND | ND | ND | - | 0.03 | - | - | - | - | - | ND | ND | ND | - |
| Volatile Haloginated Compounds (micrograms/kilogram) | - | - | - | - | ND | ND | ND | ND | - | - | - | - | - | - | - | - | - | - | - |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic (As) | 3.2 | 3.0 | 1.4 | 1.1 | 0.9 | 1.5 | 0.9 | 1.4 | 10.0 | 2.4 | 2.6 | 1.3 | 1.8 | 1.2 | 6.7 | 1.7 | 0.8 | 2.2 | 0.9 |
| Cadmium (Cd) | 0.1 | 0.4 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.5 | 5.0' | 0.2 | 0.3 | ND | ND | 0.1 | ND | 0.1 | ND |
| Chromium (Cr) | 18.0 | 14.0 | 7.0 | ND | 6.0 | 5.0 | 13.0 | ND | 33.0 | 20.0 | 22.0 | 6.0 | 8.0 | 7.0 | 20.0 | 15.0 | ND | 7.0 | ND |
| Copper (Cu) | 26.0 | 14.0 | ND | ND | ND | ND | ND | ND | ND | 37.0 | 130.0' | 8.0 | ND | ND | 25.0 | 9.0 | Nd | ND | ND |
| Mercury (Hg) | ND | 0.16 | ND | ND | ND | ND | ND | ND | ND | 1.10' | 0.07 | ND | ND | ND | 0.09 | ND | Nd | ND | ND |
| Nickel (Ni) | 10.0 | ND | ND | ND | ND | ND | ND | ND | ND | 8.0 | 6.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| Lead (Pb) | 13.0 | 330.0' | ND | 6.0 | 7.0 | ND | ND | 6.0 | 8.0 | 310.0' | 400.0' | 2.0 | 2.0 | 1.0 | 29.0 | 14.0 | 4.0 | 18.0 | 4.0 |
| Zinc (Zn) | 27.0 | 86.0 | 3.0 | 5.0 | 12.0 | 5.0 | 1.0 | 8.0 | 10.0 | 480.0' | 630.0' | 6.0 | 6.0 | ND | 77.0 | 59.0 | ND | 45.0 | ND |
| Volatile Organic Compounds (mg/kg) | - | - | - | - | ND | ND | - | ND | - | ND | - | - | - | - | - | - | - | - | - |
| Total Petroleum Hydrocarbons (mg/kg) | | | | | | | | | | | | | | | | | | | |
| $C_6$ - $C_9$ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 22 | ND | ND | ND | ND | ND |
| $C_{15}$ - $C_{36}$ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| Organophosphate Pesticides (mg/kg) | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - |
| Poly Aromatic Hydrocarbons (micrograms/kilogram) | | | | | | | | | | | | | | | | | | | |
| Napthalene | ND | 0.03 | 0.02 | 0.02 | ND | ND | ND | ND | - | - | ND | - | - | ND | - | ND | ND | ND | ND |
| Fluorene | ND | ND | ND | ND | ND | ND | ND | ND | - | - | 0.13 | - | - | ND | - | ND | ND | ND | ND |
| Phenanthrene | ND | 0.08 | 0.11 | 0.09 | ND | ND | ND | ND | - | - | 1.8 | - | - | 0.01 | - | 0.1 | ND | 0.02 | ND |
| Anthracene | ND | ND | 0.01 | ND | ND | ND | ND | ND | - | - | 0.51 | - | - | ND | - | ND | ND | 0.01 | ND |
| Fluoranthene | ND | 0.17 | 0.23 | 0.15 | ND | ND | ND | ND | - | - | 3.5 | - | - | ND | - | 0.04 | ND | 0.66 | ND |
| Pyrene | ND | 0.32 | 0.44 | 0.26 | ND | ND | ND | ND | - | - | 7.8 | - | - | ND | - | ND | ND | 1.7 | ND |
| Benzo(a)fluoranthene | ND | 0.06 | 0.09 | 0.06 | ND | ND | ND | ND | - | - | 1.2 | - | - | 0.02 | - | ND | ND | 0.23 | ND |
| Chrysene | ND | 0.06 | 0.08 | 0.05 | ND | ND | ND | ND | - | - | 0.96 | - | - | 0.02 | - | ND | ND | 0.26 | ND |
| Benzo(b)fluoranthene | ND | 0.04 | 0.06 | 0.03 | ND | ND | ND | ND | - | - | 0.56 | - | - | 0.02 | - | ND | ND | 0.17 | ND |
| Benzo(k)fluoranthene | ND | 0.03 | 0.04 | 0.02 | ND | ND | ND | ND | - | - | 0.50 | - | - | 0.01 | - | ND | ND | 0.15 | ND |
| Benzo(a)pyrene | ND | 0.06 | 0.10 | 0.06 | ND | ND | ND | ND | - | - | 1.3 | - | - | 0.04 | - | ND | ND | 0.34 | ND |
| Dibenzo(ah)anthracene | ND | ND | ND | ND | ND | ND | ND | ND | - | - | 0.08 | - | - | ND | - | ND | ND | ND | ND |
| Benzo(ghi)perylene | ND | 0.08 | 0.12 | 0.07 | ND | ND | ND | ND | - | - | 0.33 | - | - | ND | - | ND | ND | 0.23 | ND |
| Indeno(1,2,3-cd)pyrene | ND | 0.05 | 0.08 | 0.04 | ND | ND | ND | ND | - | - | 0.36 | - | - | ND | - | ND | ND | ND | ND |

*Notes:* *1 = above ANZECC 'B' levels*
*ND = not detected*
*- = not analysed*

**Table 3. Summary of assessment criteria used to determine whether soils and groundwater at the Albany Foreshore Redevelopment site are contaminated. (Source: Albany Foreshore Site Assessment)**

| | Soil Criteria | | | | Groundwater Criteria | | | |
|---|---|---|---|---|---|---|---|---|
| | A (mg/kg) | B (mg/kg) | C (mg/kg) | Document Source | A (ug/l) | B (ug/l) | C (ug/l) | Document Source |
| **Total Petroleum Hydrocarbons** | | | | | | | | |
| C6 - C9 | - | - | 100 | 3 | - | - | 500 | 3 |
| C10 - C14 | - | - | 500 | 3 | - | - | 500 | 3 |
| C15 - C28 | - | - | 1,000 | 3 | - | - | - | - |
| C29 - C36 | - | - | - | - | - | - | - | - |
| **Monoaromatic Hydrocarbons** | | | | | | | | |
| Benzene | 0.01 | 1 | 5 | 1, 2 | 0.2 | 1 | 5 | 2 |
| Toluene | 0.05 | 3 | 30 | 1, 2 | 0.5 | 15 | 50 | 2 |
| Ethyl benzene | 0.05 | 5 | 50 | 2 | 0.5 | 20 | 60 | 2 |
| Xylenes | 0.05 | 5 | 50 | 1 | 0.5 | 20 | 60 | 2 |
| **Metals** | | | | | | | | |
| Arsenic | 0.2-30 | 20 | 50 | 1, 2 | 10 | 30 | 100 | 2 |
| Cadmium | 0.04-2 | 3 | 20 | 1, 2 | 1 | 2.5 | 10 | 2 |
| Chromium | 0.5-110 | 50 | 800 | 1, 2 | 20 | 50 | 200 | 2 |
| Copper | 1-190 | 60 | 500 | 1, 2 | 20 | 50 | 200 | 2 |
| Mercury | 0.001-0.1 | 1 | 10 | 1, 2 | 0.2 | 0.5 | 2 | 2 |
| Nickel | 2-400 | 60 | 500 | 1, 2 | 20 | 50 | 200 | 2 |
| Manganese | | 500 | 5,000 | 1, 5 | | - | - | - |
| Lead | ND-200 | 300 | 600 | 1, 2 | 20 | 50 | 200 | 2 |
| Zinc | 2-180 | 200 | 3,000 | 1, 2 | 50 | 200 | 800 | 2 |
| **Phenols** | | | | | | | | |
| Total Phenols | 0.03-0.5 | 1 | 10 | 2 | 0.5 | 15 | 50 | 2 |
| **Organochlorine Pesticides** | | | | | | | | |
| Aldrin | 0.001-0.05 | 1 | 5 | 1, 2 | 0.1 | 0.5 | 2 | 2 |
| Dieldrin | 0.005-0.05 | 0.2 | 5 | 1, 2 | 0.1 | 0.5 | 2 | 2 |
| DDT | 0.001-0.97 | 1 | 5 | 1, 2 | 0.1 | 0.5 | 2 | 2 |
| **Polychlorinated Biphenyls** | | 1 | 10 | 1, 2 | - | - | - | - |
| Total | 0.02-0.1 | | | | | | | |
| **Polycyclic Aromatic Hydrocarbons** | | | | | | | | |
| Napthalene | 0.1 | 5 | 50 | 2 | 0.2 | 7 | 30 | - |
| Acenaphthylene | - | - | - | - | - | - | - | - |
| Acenapthene | - | - | - | - | - | - | - | - |
| Fluorene | - | - | - | - | - | - | - | - |
| Phenanthrene | - | 10 | 100 | 2 | - | 2 | 10 | 2 |
| Anthracene | 0.1 | 10 | 100 | 2 | 0.1 | 2 | 10 | 2 |
| Fluoranthene | 0.1 | 10 | 100 | 2 | 0.002 | 1 | 5 | 2 |
| Pyrene | 0.1 | 10 | 100 | 2 | 0.002 | 1 | 5 | 2 |
| Benzo(a)fluoranthene | - | 1 | 10 | 4 | - | 0.5 | 2 | 4 |
| Chrysene | - | 5 | 50 | 4 | - | 1 | 5 | 4 |
| Benzo(b)fluoranthene | - | - | - | - | - | - | - | - |
| Benzo(k)fluoranthene | - | - | - | - | - | - | - | - |
| Benzo(a)pyrene | 0.1 | 1 | 10 | 2 | 0.01 | 0.2 | 1 | 2 |
| Dibenzo(ah)anthracene | - | 1 | 10 | 4 | - | 0.2 | 1 | 4 |
| Benzo(ghi)perylene | - | - | - | - | - | - | - | - |
| Indeno(1,2,3-cd)pyrene | - | 1 | 10 | 4 | - | 1 | 5 | 4 |

## 4.6 Groundwater contamination

### 4.6.1. Objective

The Environmental Protection Authority's objective is to ensure that groundwater beneath and discharging from the site does not have an adverse impact on Princess Royal Harbour and people living or visiting the site.

### 4.6.2 Evaluation Framework

Existing policy framework

*'National Water Quality Management Strategy - Australian Water Quality Guidelines for Fresh and Marine Waters' Australia and New Zealand Environment and Conservation Council (1992)*

This document identifies acceptable standards for water discharge to ensure that the ecological values of aquatic ecosystems are protected. In the context of this assessment, these standards would apply to groundwater discharging into the marina and near-shore marine environment which may have been contaminated as a result of land use activities. Guidelines for acceptable marine water quality are also specified.

*Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council (1992) Australian and New Zealand Guidelines for the assessment and management of contaminated sites.*

This document is intended to provide technical guidelines to provide a framework for the assessment and management of contaminated sites in Australia and New Zealand. It provides specific guidance on identification, assessment and clean up measures, and includes environmental groundwater guidelines. The EPA has endorsed the use of this approach in the assessment of contaminated soils.

*Dutch Environmental Quality Objectives for soil and groundwater*

Levels of contamination for groundwater were determined by the Dutch in 1986, and are referred to as Dutch A, B, and C levels:- 'A' refers to background contamination levels; 'B' refers to concentrations which have reached a level which require further investigation; and 'C' refers to concentration levels at which immediate action is required. The DEP have adopted these standards as guidelines when assessing levels of soils and groundwater contamination. ANZECC Guidelines only refer to soil contamination, not groundwater. The EPA has endorsed the use of this approach in the assessment of contaminated groundwater.

Technical information

*ERM Mitchell McCotter (1995) Albany Foreshore Site Assessment*

This report was commissioned by the proponent in response to specific concerns raised by the EPA during its assessment of this proposal. The document provides information on the development site history and prior land use, site investigation procedures to determine the location and extent of contaminated soils and groundwater, and presents the results and an analysis of this information.

In summary, key conclusions of this report in relation to groundwater contamination were :

- analysis of on-site groundwater monitoring wells indicated elevated levels of PAH's and one incident of Arsenic above ANZECC 'B' level;
- off-site groundwater monitoring wells indicated similar concentrations and types of PAH's and arsenic as found in the on-site wells;

- impacts of contaminated groundwater discharge into the Harbour has an insignificant effect on Harbour water quality; and
- there is a significant risk to human health if groundwater at the site was ingested, however as there is no intention of using the groundwater as a potable water source, this risk is deemed to be insignificant and no form of remediation is recommended.

*'Human Health Risk Assessment' - Appendix D of the Albany Foreshore Site Assessment Report, ERM Mitchell and McCotter (1995)*

This report was commissioned by the proponent in response to specific concerns raised by the EPA during the assessment of this proposal. It evaluated a number of hypothetical pathways to determine the probability of adverse health impacts associated with contaminated groundwater on persons living on the redevelopment site. It concluded that the groundwater is not considered to present a significant impact on human health, and therefore the site could be redeveloped without remedial action being necessary.

*Advice from officers of the Geological Survey Division of the Department of Minerals and Energy*

Specialist advice was sought from this Department on the potential impact of contaminated groundwater on marine water quality within Princess Royal Harbour. This advice concluded that it is unlikely that PAH concentrations in seawater near the contaminated groundwater will exceed ANZECC marine water guidelines.

Comments from key Government agencies

The issue of contaminated groundwater was not addressed in the CER. The DEP consider that this is an important issue which has implications on the future use of the redevelopment site, particularly as urban development is proposed, and on the water quality within the near shore marine environment of Princess Royal Harbour.

### 4.6.3 Response from the proponent

This issue was not addressed within the CER document, however in response to concerns expressed by the DEP and the EPA additional work was commissioned by the proponent to determine the extent and nature of contamination of groundwater beneath the development site.

Preliminary research undertaken by the proponent in July 1995 indicated that groundwater at the site is contaminated with heavy metals and PAH's. Initial samples indicate levels which exceed Dutch B and C standards.

Additional information on the nature, extent and source of groundwater contamination, the potential impact of the contaminated groundwater on the near-shore marine environment in Princess Royal Harbour, and the possible methods for treating and or managing the polluted groundwater was subsequently presented within the 'Albany Foreshore Site Assessment' report, which was forwarded to the DEP on 13 September 1995. As part of this additional research, 5 off-site groundwater monitoring bores were installed by the proponent in an attempt to identify the source of contamination. This report concluded that :

- the plume of PAH contaminated groundwater is either originating from an off-site source, or is present throughout the general area, and is travelling in a southerly direction towards the Harbour; and
- contaminated groundwater is discharging into Princess Royal Harbour at a rate which is rapidly diluted with ocean water. Accordingly, the contaminants within the discharging groundwater do not pose a threat to the beneficial use of either the Albany Foreshore or the Princess Royal Harbour.

Options for treating or managing the groundwater are not addressed within the report, however, it was recognised that removing the soils which have been identified as being contaminated may contribute towards an improvement in groundwater quality.

The following commitments are made :

- the proponent commits to making the necessary contractual arrangements in order that the contractor ensures that construction workers on site who may have potential prolonged or significant contact with sub-surface soil and / or groundwater, wear necessary protective clothing in order to avoid dermal contact or ingestion of these media (Commitment 1.2.3, Appendix 5); and.
- the proponent commits to carry out necessary measures in order to prevent the use of groundwater from the subject premises as a potable source of water until such time as the groundwater quality is reassessed and found to be of an accepted standard. This reassessment should be undertaken in consultation with and to the satisfaction of the DEP (Commitment 1.2.4, Appendix 5).

### 4.6.4 Evaluation

In view of the previous land uses on the redevelopment site, the EPA considers it is possible that groundwater beneath the site may be polluted, especially as groundwater levels are known to be high in the vicinity of the foreshore. The EPA considers that the issue of contaminated groundwater beneath the development site has significant implications on the future use of the site, and on water quality within the adjacent near-shore marine environment.

In view of the above concerns, the EPA requested the proponent to undertake additional work to determine whether the groundwater is contaminated on 18 May 1995.

Preliminary research undertaken by the proponent and presented to the DEP in July 1995 indicated that groundwater at the site is contaminated with heavy metals and PAH's. Initial samples indicate levels which exceed Dutch B and C standards.

Following consideration of this information, the EPA considered that there was still inadequate information available for it to complete its assessment on this proposal. Accordingly, additional information was requested from the proponent on 14 August 1995 on the nature, extent and source of groundwater contamination, the potential impact of the contaminated groundwater on the near-shore marine environment in Princess Royal Harbour, i.e. environmental risk, and the possible methods for treating and or managing the polluted groundwater.

The above information was subsequently presented within the 'Albany Foreshore Site Assessment' report, which was forwarded to the DEP on 13 September 1995. The location of the groundwater monitoring wells is indicated in Figure 6. Table 3 includes details of the assessment criteria used to determine whether the groundwater is considered to be contaminated, and Table 4 includes a summary of the groundwater contamination levels identified by the proponent.

As part of this additional research, 5 off-site groundwater monitoring bores were installed by the proponent in an attempt to identify the source of contamination, as indicated in Figure 6.

The 'Albany Foreshore Site Assessment' report concluded that :

- the plume of PAH contaminated groundwater is either originating from an off-site source, or is present throughout the general area, and is travelling in a southerly direction towards the Harbour; and
- the contaminated groundwater is discharging into Princess Royal Harbour at a rate which is rapidly diluted with ocean water. Specialist advice subsequently sought by the DEP from

**Table 4. Contamination levels of groundwater sampled at the Albany Foreshore Redevelopment site. (Source: Albany Foreshore Site Assessment)**

| Parameter/Monitoring Well (detection limits) | MW1 | MW2 | MW3 | MW4 | MW5 | MW6 | MW7 | MW8 | MW9 | MW10 | MW11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 13-7-95 | 13-7-95 | 13-7-95 | 13-7-95 | 13-7-95 | 13-7-95 | 20-8-95 | 20-8-94 | 20-8-95 | 20-8-95 | 20-8-95 |
| Metals (0.05-50 µg/L) | | | | | | | | | | | |
| Arsenic (As) | ND | 10 | ND | 46[1] | 26 | 19 | 15 | 82[1] | ND | ND | ND |
| Cadmium (Cd) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chromium (Cr) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Copper (Cu) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Mercury (Hg) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Nickel (Ni) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Lead (Pb) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Zinc (Zn) | ND | ND | ND | ND | ND | 90.0 | 160 | 420[1] | 100 | 160 | 60 |
| Total Petroleum Hydrocarbons (40-200 µg/L) | - | - | - | - | - | - | ND | ND | ND | C15-C28 570 | ND |
| Polychlorinated Biphenyls (0.02 µg/L) | - | - | - | - | - | - | - | 16 | - | - | - |
| Volatile Halogenated Compounds (0.5 µg/L) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Volatile Organic Compounds (1-3 µg/L) | - | - | - | - | - | - | ND | - | - | - | - |
| Poly Aromatic Hydrocarbons (0.05-0.5 µg/L) | | | | | | | | | | | |
| Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Fluorene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Phenanthrene | ND | 0.11 | 0.13 | 0.94 | 1.2 | 0.13 | 0.16 | 0.54 | 0.46 | ND | 0.22 |
| Anthracene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.06 |
| Fluoranthene | 0.22 | 0.44 | 0.92 | 3.6[1] | 7.0[2] | 0.66 | 0.48 | 2.3[1] | 1.7[1] | 0.42 | 0.59 |
| Pyrene | ND | 0.72 | 2.2[1] | 5.4[2] | 13[2] | 1.9[1] | 1.0[1] | 4.9[1] | 3.7[1] | 0.84 | 1.2[1] |
| Benzo(a)fluoranthene | 0.06 | 0.17 | 0.55[1] | 1.4[1] | 2.2[2] | 0.2 | 0.21 | 1.2 | 0.79 | 0.16 | 0.29 |
| Chrysene | 0.06 | 0.16 | 0.58 | 1.4[1] | 2.4[1] | 0.22 | 0.17 | 1.0[1] | 0.70 | 0.14 | 0.24 |
| Benzo(b)fluoranthene | ND | 0.09 | 0.32 | 0.84 | 1.4 | 0.15 | ND | 0.66 | 0.57 | 0.13 | 0.21 |
| Benzo(k)fluoranthene | ND | 0.09 | 0.29 | 0.68 | 1.2 | 0.11 | 0.10 | 0.59 | 0.47 | 0.09 | 0.16 |
| Benzo(a)pyrene | 0.07 | 0.24[1] | 0.75[1] | 1.9[2] | 3.1[2] | 0.28[1] | 0.23 | 1.3[2] | 1.02 | 0.19 | 0.31[1] |
| Dibenzo(ah)anthracene | ND | ND | ND | ND | ND | ND | ND | 0.11 | 0.09 | ND | ND |
| Benzo(ghi)perylene | 0.05 | 0.18 | 0.39 | 1.2 | 2.4 | 0.23 | 0.19 | 0.96 | 0.63 | 0.17 | 0.24 |
| Indeno(1,2,3-cd)pyrene | ND | 0.08 | 0.32 | 0.72 | 1.8[1] | 0.18 | ND | 0.71 | 0.60 | ND | 0.19 |

*Notes:* *1 = above ANZECC 'B' levels*
*2 = above ANZECC 'C' levels*
*ND = below detection limits*
*- = not analysed*

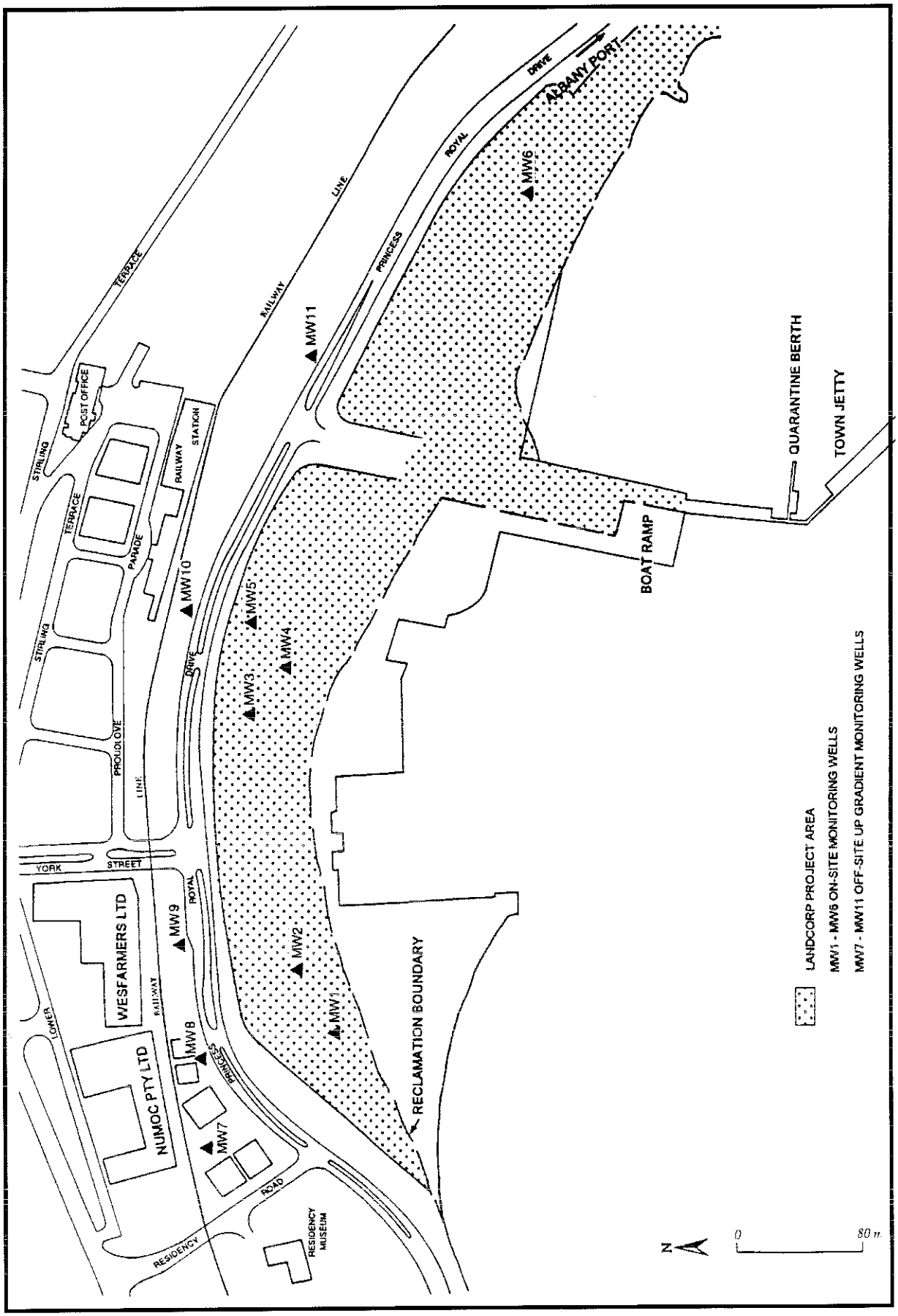



*Figure 6. Map indicating the location of groundwater monitoring well locations at the Albany Foreshore Redevelopment site. (Source: Albany Foreshore Site Assessment)*

the Department of Minerals and Energy confirms that PAH concentrations in seawater near the contaminated groundwater discharge sites are unlikely to exceed ANZECC marine water guidelines.

The EPA notes that options for treating or managing the groundwater are not included within the report, however, it was recognised that removing the soils which have been identified as being contaminated may contribute towards an improvement in groundwater quality, and that commitments are made by the proponent to ensure the necessary contractual arrangements are made to protect construction workers on-site from adverse impacts of polluted groundwater, and measures are undertaken in order to prevent the use of groundwater from the subject premises as a potable source of water until such time as the groundwater quality is reassessed and found to be of an acceptable standard.

The EPA has reviewed this additional information carefully, and considers that further work is till needed to address the following outstanding issues :

- the definition and nature of the source of groundwater contamination, including contaminants originating from outside the redevelopment area, which may contribute to the accumulation of pollutants in the locality. The determination of this source should be co-ordinated by the DEP;
- the need to determine the extent of the on-site contamination and whether the rates of groundwater contamination are likely to increase;
- assurance that dewatering activities associated with the construction of the proposed development can be managed in such a way so as to avoid direct human contact with groundwater or direct discharge to Princess Royal Harbour, to the satisfaction of the DEP;
- assurance that there is no abstraction of groundwater on the proposed development site following the construction phase; and
- assurance that no structures are constructed below ground from the development site, except for building footings and normal infrastructure.

Accordingly, **the EPA recommends that :**

- **the source of groundwater contamination should be identified through investigation co-ordinated by the Department of Environmental Protection prior to site development and a management plan prepared and then implemented** (Recommendation 5). Further, **the EPA considers that the nature of the source of groundwater contamination should be determined as soon as possible, to determine the degree of contamination, and whether the rates of contamination are likely to increase** (Recommendation 6).

The EPA also considers that in view of the degree of contamination of the groundwater, any exposure to it should be carefully managed to ensure there is no risk to public health. Accordingly, **the EPA recommends that:**

- **dewatering activities associated with the construction of the proposed development should be managed in such a way as to avoid direct human contact with groundwater or direct discharge into Princess Royal Harbour, to the satisfaction of the Department of Environmental Protection** (Recommendation 7);
- **no abstraction of groundwater take place on the proposed development site following the construction phase of the development** (Recommendation 8); and
- **no structures be constructed below ground on the development site, except for building footings and normal infrastructure** (Recommendation 9).

## 4.7 Impact on water quality within Princess Royal Harbour

### 4.7.1 Objective

The Environmental Protection Authority's objective is to ensure that water quality within Princess Royal Harbour during the reclamation phase is maintained to an acceptable standard.

### 4.7.2 Evaluation framework

Existing policy framework

*Albany Harbours Environmental Study 1988 - 1989. Environmental Protection Authority Bulletins 412 and 426.*

The Albany Harbours Environmental Study was prepared in 1990 for the EPA by the Albany Harbours Technical Advisory Group. Bulletins 412 and 426 summarise work undertaken during 1988 and 1989 on the state of Princess Royal and Oyster Harbours. The work focused on the environmental problems experienced within the harbours, and consisted of a number of interrelated studies that provide the technical rationale for a number of management recommendations, with the ultimate aim of identifying solutions to these environmental problems. Studies undertaken included an inventory of the major sources and types of pollutants entering the harbours, water circulation patterns, and an assessment of nutrient stores accumulated in the waters, sediments and plants. The work concluded that the waters within the harbours are enriched with nutrients. One major recommendation was the formation of a management organisation to provide an on-site co-ordinating role for management of the harbours and their associated waterways.

*Draft Albany Waterways Management Programme. Albany Waterways Commission Report No. 45, 1994.*

This programme was drafted to provide strategies and actions required to address the issues facing the Albany waterways, with the overall aim of improving and maintaining the ecological health of the Albany harbours. The programme is designed to guide the AWMA's operations, and to provide direction for other organisations, agencies and groups in waterways management.

*'National Water Quality Management Strategy - Australian Water Quality Guidelines for Fresh and Marine Waters' Australia and New Zealand Environment and Conservation Council (1992)*

This document identifies acceptable standards for water discharge to ensure that the ecological values of aquatic ecosystems are protected. In the context of this assessment, these standards would apply to stormwater and groundwater discharging into the marina and near-shore marine environment which may have been contaminated as a result of previous land use activities.

Comments from key Government agencies

Fisheries Department expressed concern regarding sediment plumes having an impact on areas away from the immediate reclamation area especially on seagrass areas.

AWMA expressed concern regarding sediment plumes having an impact on areas away from the immediate reclamation area especially on seagrass areas. AWMA considers it important that reclamation should be managed so that it does not lead to a plume of sediment reaching other parts of the Harbour to the detriment of seagrass and other biota, and the suggestion that monitoring of the impacts of reclamation is supported. The sites and transects surveyed should be chosen in consultation with AWMA. A detailed reclamation management plan needs to be prepared, and a reclamation licence obtained from AWMA.

### 4.7.3 Response from the proponent

The proponent has acknowledged that there is likely to be some short term impact on water quality within the marine environment.

The proponent's commitments listed within Section 4.2.3 of this report are designed to reduce any impacts on water quality within Princess Royal Harbour during the reclamation phase of the proposed development.

### 4.7.4 Evaluation

The EPA considers that turbidity associated with land reclamation has the potential to have a short term impact on the water quality of the immediate adjacent marine environment. However, is considered unlikely to have a significant adverse long term impact on water quality within Princess Royal Harbour, provided the proponent's commitments are adhered to, in consultation with AWMA and the Fisheries Department.

The Environmental Protection Authority recommends that (Recommendation 10) the Fisheries Department and the Albany Waterways Management Authority be consulted regarding the monitoring of impacts of reclamation on water quality within Princess Royal Harbour prior to and during the construction phase of the development.

## 4.8 Noise management

### 4.8.1 Objective

The Environmental Protection Authority's objective is to ensure that noise levels from heavy vehicles and trains experienced by residents on the proposed development site are maintained within acceptable limits.

### 4.8.2 Evaluation framework

Existing policy framework

*Marlston Hill Assessment (EPA Bulletin 774)*

This assessment by the EPA involved a proposed urban development adjacent to the main Bunbury Harbour access road. The assessment report identified noise control as a key issue. The EPA established a policy position on noise control in this assessment, i.e. attaining an internal noise level of less than 35 dB $_{LAeq}$ between 2200 hours and 0700 hours in bedrooms only, arising from road and rail traffic.

Comments from key Government agencies

Westrail expressed concern regarding noise associated with road and rail traffic to the Port. It was considered that an increased population density resulting from the foreshore redevelopment proposal is likely to make the existing noise problem resulting from road and rail traffic worse.

The Main Roads Department raised the concern that the issue of noise with respect to road traffic (and not rail) is vague in that it relates only to the pre-construction phase of the development. It was noted that potential traffic and associated noise levels are likely to increase with more frequent heavy vehicle movements to the port, and increase in traffic generated by the development itself.

The DEP also raised concerns regarding the potential impact of noise from road and rail traffic on future residents of the proposed Foreshore Redevelopment.

### 4.8.3 Response from the proponent

In view of the concerns raised in submissions, and following liaison with officers of the Department of Environmental Protection, the proponent has provided the following commitment (Commitment 1.8.1, Appendix 5):

*The proponent commits to recommending that the Town of Albany and the Ministry for Planning designate specifically in the Precinct Plans for the foreshore development the building design and construction guidelines required to achieve the following noise conditions for residential buildings facing onto Princess Royal Drive :*

- *an internal noise standard of 35 dB $L_{Aeq}$ over any fifteen minute period between 2200 hours and 0700 hours in bedrooms only for any road and rail traffic;*
- *50 dB $L_{Amax}$ for noise from any rail activities between 2200 hours and 0700 hours.*

*The proponents are prepared to accept some or all of the following Development Conditions to achieve the above noise standards:*

- *bedrooms shall preferably be placed in the part of the house furthest away from the road;*
- *all walls shall be constructed of double brick;*
- *all roof materials shall be either clay or concrete tiles;*
- *all glazing shall be 10 mm thick laminated;*
- *all external doors shall be of solid core construction with seals;*
- *all ceilings shall be insulated;*
- *all plasterboard ceilings shall be 19 mm thick; and*
- *mechanical ventilation shall be installed.*

### 4.8.4 Evaluation

The EPA considers that noise from heavy vehicles and trains may have an unacceptable impact on future residents of the Foreshore Redevelopment site.

This issue is considered to be similar to other noise related issues which have previously been raised within the context of other assessments undertaken by the EPA in recent months. It is considered important that the EPA present a consistent position regarding noise control with similar development proposals, for example the 'Bunbury Harbour City - Marlston Hill' proposal.

This issue was not considered to have been adequately addressed within the CER document, and the proponent has subsequently prepared an additional commitment, as detailed above.

The EPA' expectations are that noise levels associated with road and rail activities are restricted to within acceptable limits. The EPA's objective against which it will evaluate performance is that noise be restricted to 50 dB $L_{Amax}$ for noise from any rail activities between 2200 hours and 0700 hours. Instantaneous maximum noise levels of 45 dB $L_{Amax}$ for any road vehicle movement passing by between those hours should also be met. These limits are the same as those specified in the Marlston Hill assessment.

The EPA notes the proponent's commitment in relation to noise control. The EPA considers that this commitment should meet the above specified environmental objectives, provided all the specified development conditions are accepted by the proponent.

In reaching this conclusion, the EPA is aware of the fact that it relates to a third party and therefore can only be implemented as an environmental condition or planning condition. Accordingly, the EPA recommends that the DEP liaise closely with the Ministry for Planning to ensure that the proponent's commitment to noise control during the rezoning and subdivision phase of the development is implemented through the planning approval process.

## 4.9 Constraint to future Port development

### 4.9.1 Objective

The Environmental Protection Authority's objective is to ensure that Government is aware that the proposed redevelopment may compromise some long term operations of the existing Port.

### 4.9.2 Evaluation framework

Technical information

*'Albany Foreshore Development - Port Access Study' (1995) Halpern Glick and Maunsell for Landcorp*

This document addressed the feasibility of providing a grade separation at the York Street level crossing to ensure long term access to the Port of Albany. It concluded that grade separation of the railway and Princess Royal Drive to achieve uninterrupted access to the Port is not required due to projected low volumes of long term future traffic, both to the Port and the Foreshore Redevelopment site.

*'Report on Port Access', Albany Port Authority (unpublished)*

This is an unpublished report prepared by the Port Authority on Port access. The report highlights that the future trade developments that the Port will be expected to cater for through to the year 2020. At present, the number of truck movements on the port access road, Princess Royal Drive, is in the order of 45,900 per year (based on 1994 statistics). By the year 2000, truck movements are anticipated to be in the order of 109,500 per year.

Comments from key Government agencies

A submission was not received by the Albany Port Authority within the public review period. However, in response to a request from the EPA on 10 April 1995, the Albany Port Authority has advised that continuous residential development on access routes as well as close to the perimeter of the Port may constrain the Port's ability to handle increased trade.

It is also concerned that continual residential development close to the perimeter of the Port, particularly on the Port's northern boundary, will stifle long term Port operations and restrict the Port's ability to react to the demands of new industries wishing to use the Port.

### 4.9.3 Response from the proponent

The proponent was given the opportunity to respond to letter from the Albany Port Authority, however it was considered that the issue of long term constraint to Port - related activities lies outside the responsibility of the proponent.

### 4.9.4 Evaluation

The EPA believes that proposed residential development in close proximity to existing Port operations may restrict long term plans for Port expansion.

A submission from the Albany Port Authority was not received during the public submission period. However, in view of the close proximity of the proposed foreshore redevelopment to the Port, the EPA believed that it was important that the views of the Port Authority on the proposed development are known before a proper assessment of all the environmental implications associated with the proposal could be undertaken. Accordingly, the EPA formally requested Port Authority's views on the following issues on 10 April 1995 :

- the implications of the proposed development on future Port development, i.e. over the next 50 years;
- the adequacy of the access corridor, i.e. Princess Royal Drive, to adequately service current and future Port projections; and
- whether there exists an adequate buffer between the Port and Foreshore Redevelopment proposal to allow for future expansion of the Port.

The EPA has subsequently reviewed the advice forwarded by the Port Authority on 24 April 1995. In summary, this advice states that continuous residential development on access routes, i.e. Princess Royal Drive and adjacent to the railway line, as well as close to the perimeter of the Port may stifle the Port's ability to handle increased trade.

It was considered that residential development adjacent to the Port's northern boundary may constrain long term Port operations and restrict the Port's ability to react to the demands of new industries wishing to use the Port.

The EPA is aware that residential development in close proximity to ports throughout the State has the potential to impact on future port operations, in terms of maintenance of adequate buffers. The EPA believes that a pro-active approach needs to be undertaken to address this issue, and that planning authorities need to take into consideration and support the long term requirements of ports such as Albany in a general planning context.

The EPA considers that this issue should be the subject of on-going discussion between the EPA and the Western Australian Planning Commission (WAPC). Discussion has already commenced with the WAPC regarding this issue, as it has become an outstanding issue which requires resolution in relation to urban development in close proximity to a number of other regional ports in the State.

## 4.10 Risks and hazards

### 4.10.1 Objective

The Environmental Protection Authority's objective is to :

- ensure that risk to future residents and visitors of the redevelopment site meets acceptable criteria, in view of the close proximity of the Albany Port; and
- ensure that the safety of pedestrians travelling to and through the proposed redevelopment site is properly considered by relevant authorities.

### 4.10.2 Evaluation framework

Existing Policy framework

*EPA Risk Criteria (EPA Bulletin 611)*

Bulletin 611 identifies the requirements and approach to be adopted for the evaluation of risks and hazards associated with industrial developments in WA. The Bulletin includes an explanation of when there is a requirement for risk assessment, the scope and extent of risk assessment which may be required by the EPA, the intent and purpose of cumulative risk assessments, and a definition of levels of risk to the public and neighbours from a development which are acceptable.

The Bulletin states that risk levels from industrial activities should not exceed a target of fifty in a million per year at the site boundary for each individual industry, and the cumulative risk level imposed upon an industry should not exceed a target of one hundred in a million per year. A

risk level for any non-industrial activity located in buffer zones between industrial facilities and residential zones of ten in a million per year or lower, is so small as to be acceptable by the EPA. Residential areas should not be exposed to individual risk levels greater than one in a million per year.

Technical information

*Albany Foreshore Redevelopment - CER - Appendix B 'Risk Assessment'.*

This report provides an opinion on the risks presented by storage and unloading activities at the Port of Albany on the Albany Foreshore redevelopment area. The report concludes that the proposed foreshore redevelopment does not present any societal risk issues requiring detailed assessment, as it is not proposed to handle or store dangerous goods, and that therefore risk criteria specified by the EPA in Bulletin 611 cannot be applied. However, it is recognised that the nearby Port of Albany handles a range of materials which are potentially hazardous.

A summary of materials handled by the Port of Albany and their associated hazard potential was presented within Appendix B, and is reproduced within this assessment report as Table 5. It was concluded that the potential risk from these materials to the Albany Foreshore redevelopment is effectively nil, and that at this stage, no further investigation is warranted.

Truck movements along the northern boundary of the development site, on Princess Royal Drive, was identified as a major risk factor, as heavy vehicles would be using the same road as private and commercial vehicles entering and leaving the development area. It was considered that this issue could be handled by appropriate design of access/egress routes from the site and the use of traffic control devices.

A potential risk was also identified from tankers carrying LPG or petrol along Princess Royal Drive, through for example the risk of fire, or blast from an explosion in the event of an accident. The actual risk is dependent upon the number of truck movements per day, proximity of the roadway to proposed land uses and nature of the land uses. Medium density residential development is proposed in the vicinity, with an offset distance from the road of between 15 and 30 metres. As tanker movements do not exceed 25 movements per day, the risks to residents from tanker movements are not considered to exceed EPA public risk criterion.

*'Truck Transport Risk, Princess Royal Drive, Albany Foreshore Redevelopment' (1995) ICI Engineering Report for Landcorp.*

This report was prepared by ICI Australia Engineering Pty Ltd and examines the risk issues associated with the transport of petrol and LPG fuels by road tanker along Princess Royal Drive, Albany, along the north-west boundary of the Albany Foreshore Redevelopment site.

*'Albany Foreshore Development Port Access Study' (1995) Halpern Glick Maunsell for Landcorp.*

This document addressed the feasibility of a grade separation at the York Street level crossing to ensure long term access to the Port of Albany. It concluded that grade separation of the railway and Princess Royal Drive to achieve uninterrupted access to the Port is not required due to projected low volumes of long term future traffic, both to the Port and the Foreshore Redevelopment site.

Comments from key Government agencies

The Albany Port Authority raised concerns that the amount of traffic using the Port access road, which is considerable, and believes that a pedestrian overpass or underpass is warranted. It is also considered that the redevelopment proposal on the Albany Foreshore has the ability to have a significant impact on rail access to the Port. The Port Authority has also advised that based on

**Table 5. Summary of materials handled by the Port of Albany and their associated hazard potential. (Source: Albany Foreshore Redevelopment Project)**

| MATERIAL | HOW/WHERE STORED | HAZARD POTENTIAL AND MITIGATION FACTORS |
|---|---|---|
| Fertilisers | 10,000 tonne within the Port (Summit Fertilisers) Truck movements of ~4,200 external to the Port | Low hazard. Mitigated by management of the material and by separation from the proposed redevelopment of over 750 m |
| Petroleum Products: - petrol - diesel - LPG | Petrol and diesel are stored by Shell, Caltex and Ampol at the eastern end of the Port. Arrives by ship and i8 dispatched by road. LPG Is stored by Boral. Arrives and delivered by truck | Hazards are fire, gas fire, flash fire. LPG quantities are small and risk of explosion would be low. Mitigation is by separation of over 1.5 km from proposed redevelopment - this would be sufficient to prevent against the worst case: explosion of an LPG storage vessel |
| Grain Storage: - wheat, barley, oats, lupins | Total silo capacity is ~350,000 tonne, operated by CBH. | Hazard is minor. Grain silos can suffer from dust explosions but external damage zone is limited. Mitigation is by separation of over 750 m |
| Frozen Meat Silica Sand (1995) Cold Store (1996) | These activities do not present any risk actors to the proposed redevelopment | |
| Woodchips (1996) | Storage in Port of up to 300,000 tonne | Potential for some dust to be generated, but this should be managed at the source. Fire in woodchip stores tends to burn slowly and is unlikely to present any risk beyond the actual heap. Mitigation Is by separation |

the anticipated increase in cargo through the Port in the next 25 years, the Port Authority does not believe that any cargo would be hazardous and that therefore there is not considered to be a risks and hazard issue.

The Main Roads Department (MRD) raised the concern that there is potential for conflict between port - related traffic and tourist / residential related traffic, and it was noted that the commitment to control traffic made within the CER relates only to the construction phase of the proposal. It was considered important that the proponent take into consideration the safety of all traffic accessing the development site, and through traffic. The issue of pedestrian safety was also raised, for pedestrians crossing Princess Royal Drive and the railway. The proposed pedestrian bridge near the railway is supported, however it does not cater for people moving from York Street to the Town Centre.

MRD also noted that the 'right of access' to the port by heavy haulage vehicles must be protected as there is no alternative means of access to the port. It was noted that the future widening of Princess Royal Drive to a 4 lane dual access road is a Priority A proposal in the ROADS 2020 Strategy.

Westrail considers that the risk analysis conducted as part of the CER does not adequately consider the risk imposed by rail traffic running parallel with the northern boundary of the Study Area for the Foreshore Redevelopment. It was noted that it is essential that Westrail maintain its rights to operate 24 hours per day.

Westrail also expressed the view that the issue of public safety for people crossing the railway line other than via the proposed overhead footbridge and existing level crossings is not adequately addressed in the CER document. It was considered that this issue needs to be more carefully considered and a solution found.

In view of concerns raised in the above submissions, specialist advice was sought from the Department of Minerals and Energy (DOME) on 5 April 1995, in relation to public risk issues. This advice was subsequently received on 5 May 1995. DOME advised that as Princess Royal Drive is a major access port service road, which runs adjacent to the accommodation precinct, it is recommended that a separation distance of a minimum of 25 metres be adopted to the closest residence. The Department has also advised that the proposed development is sufficiently far away from Port Authority Berths 1, 2, and 3 and also the fuel storage depot so as not to pose unacceptable risks on the accommodation precinct. It was noted that the Port does not import any explosive grade ammonium nitrate. DOME also stated that in the long term as the port grows, it will become inevitable that an alternative port heavy haulage route be identified.

### 4.10.3 Response from the proponent

A 'Risks and Hazards' study was prepared by ICI Engineering and included in Appendix B of the CER document. As a result of this study, a separation distance of 15 to 30 metres between Princess Royal Drive and residential development is proposed within the CER.

Advice received from DOME on this issue was provided to the proponent. This advice recommends that a separation distance of a minimum of 25 metres be adopted between Princess Royal Drive and the closest residence. In view of this advice an additional study was commissioned by Landcorp from ICI Engineering. This additional study was based on the current minimum separation distance of 10 metres from the edge of Princess Royal Drive and the boundary of the redevelopment site, and concluded that the fatality risk to residents within the proposed development along Princess Royal Drive from transport of fuels by road is below the EPA criterion for individual risk of 1 per million per year. The proponent subsequently advised the DEP on 19 July 1995 that in view of this advice, the originally proposed separation distance of between 15 and 30 metres is considered to be adequate, and it is not considered necessary to provide a further commitment on this issue.

In view of the concerns raised in submissions on public risk posed by road and rail traffic travelling to and from the Port, the proponent also commissioned a further study entitled the 'Albany Foreshore Development Port Access Study' by Halpern Glick Maunsell. This document addressed the feasibility of providing a grade separation at the York Street level crossing to ensure long term access to the Port of Albany, and concluded that grade separation of the railway and Princess Royal Drive to achieve uninterrupted access to the Port is not required due to projected low volumes of long term future traffic, both to the Port and the Foreshore Redevelopment site. No additional commitment was subsequently made on this issue.

### 4.10.4 Evaluation

The EPA has identified three issues of concern in relation to potential risks and hazards, i.e.:

- risk to members of the public as a result of existing or future port operations at the Port of Albany:
- public risk from transport of hazardous materials to and from the Port; and
- public risk from road and rail traffic travelling to and from the Port.

**Future Port operations**

The EPA notes that the proposed urban development lies in close proximity to the Port of Albany. It is considered by the EPA that this may present a risks and hazards issue to people living at the redevelopment site if the transfer and handling of hazardous goods does commence as part of on-going Port operations.

The EPA has reviewed advice received from the Albany Port Authority, which states that hazardous cargo which would present a risk to public health is unlikely to be handled at the Port for the next 25 years . The Port Authority concludes that risk to the public as a result of the close proximity of on-going Port operations to proposed urban development is unlikely to be an issue for the next 25 years.

Following the consideration of this advice, the EPA acknowledges that the risk to public from the handling of hazardous cargo projections is environmentally acceptable at this time. However, should current Port cargo projections change and hazardous or dangerous goods be introduced through the Port, this proposal may, if implemented, constrain long term development options, particularly as Princess Royal Drive is the only heavy vehicle access road into the Port.

Accordingly, **the EPA recommends that when Government decides on whether this proposal should proceed, it should include consideration of the likelihood that this proposal may constrain potential growth of the Port with respect to some forms of cargo.** (Recommendation 11) This also reflects the advice given by DOME (see Section 4.10.2 above).

This constraint could be reduced by providing greater separation between the Port access and residential development proposed, or by the provision of alternative access to the Port.

**Public risk from transport of hazardous materials to and from the Port**

The EPA notes that there is a potential risk to residents living in close proximity to the Princess Royal Drive, which is the only Port access road, and which is adjacent to the only rail route to the Port. Road and rail rely on this route to transport hazardous materials such as fuel to and from the Port. Long term plans indicate that this road will eventually be upgraded to a 4 lane dual access road to the Port. It was noted that a separation distance of 15 to 30 metres between Princess Royal Drive and residential development is proposed within the CER.

In view of this concern, specialist advice was requested from the Department of Minerals and Energy on 5 April 1995. DOME subsequently advised that as Princess Royal Drive is a major access Port service road, which runs adjacent to the accommodation precinct, it is recommended that a separation distance of a minimum of 25 metres be adopted to the closest residence. This advice was forwarded to the proponent for information and comment.

The EPA notes that in response to this additional advice, an additional risk assessment was undertaken on behalf of the proponent by ICI Engineering. This additional study was based on the current minimum separation distance of 10 metres from the edge of Princess Royal Drive and the boundary of the Redevelopment site, and concluded that the fatality risk to residents within the proposed development along Princess Royal Drive from transport of fuels by road is below the EPA criterion for individual risk of 1 per million per year. The proponent subsequently advised the DEP that in view of this advice, the originally proposed separation distance of between 15 and 30 metres is considered to be adequate.

The EPA notes the discrepancy between the advice forwarded by the DOME and the proponent, however it considers that this issue may be resolved through further detailed discussion between the proponent and DOME. Accordingly, **the EPA recommends that the proponent should in consultation with the Department of Minerals and Energy, define and implement an appropriate setback distance between residential dwellings and Princess Royal Drive, to ensure that there is no risk to public safety, prior to the development of the Precinct plans, to the satisfaction of the EPA** (Recommendation 12).

**Public safety from road and rail traffic travelling to and from the Port.**

The EPA notes that considerable concern was expressed in submissions on the issue of rail and vehicle traffic travelling to and from the Port of Albany via Princess Royal Drive, and rail traffic, generated as a result of on-going Port operations. The EPA also acknowledges that a significant increase in domestic vehicle and pedestrian traffic is also likely to be generated as a result of the foreshore redevelopment.

This traffic may present a risk to public safety for pedestrians wishing to gain access to the foreshore development from the main Albany Town Centre along York Street.

Plans included within the CER document indicate a future pedestrian overpass across Princess Royal Drive and the railway line at some future date, however this is considered unlikely to be adequate in the long term.

This is considered to be primarily a public safety issue, however the EPA expects the proponent to liaise with the Town of Albany and the Main Roads Department to ensure adequate provision of safe pedestrian crossing across the road and railway line are incorporated within the final Precinct designs.

# 5. Conclusions

The Environmental Protection Authority concludes that, while the general concept by Landcorp to undertake the Albany Foreshore Redevelopment, including limited reclamation of Princess Royal Harbour, is environmentally acceptable, the development plan as proposed is not acceptable.

However, the EPA considers that the development plan could be made environmentally acceptable, subject to the proponent's commitments and the Environmental Protection Authority's recommendations. A summary of the Environmental Protection Authority's views are set out in Table 6.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental topics requiring consideration as :

- dredging and reclamation of a portion of Princess Royal Harbour;
- impact on marine flora and fauna;
- impact on off-shore coastal processes;
- impact on water quality within Princess Royal Harbour;
- stormwater management;
- soil contamination
- groundwater contamination;
- noise management;
- constraint to future Port development; and
- risks and hazards.

**Recommendation 1**

**The Environmental Protection Authority concludes that the general concept of the proposal by Landcorp to reclaim a portion of Princess Royal Harbour, to allow for the proposed Albany Foreshore Redevelopment to proceed is acceptable on environmental grounds.**

**However, the present developmental plan is environmentally unacceptable. It is considered that the plan could be made environmentally acceptable subject to the satisfactory implementation of the proponent's commitments and incorporation of the EPA's recommendations.**

**Table 6. Summary of Environmental Protection Authority advice**

| Issues | Environmental Objective | EPA advice | Proponent's response | EPA Recommendations |
|---|---|---|---|---|
| Reclamation of a maximum of 3.5 ha for residential and commercial development. | Protect the environmental values of Princess Royal Harbour. | A portion of the Harbour (maximum of 3.5 ha) is proposed to be reclaimed. While acknowledging the principle that waterways should not be reclaimed for residential purposes, the EPA has concluded that some reclamation is environmentally acceptable as the area does not support significant population of marine fauna or flora (with the exception of areas seagrass - see following section). | Reclamation alignment adopted to take advantage of viewlines. | Refer to EPA view on seagrass below. |
| Dredging of the Harbour may have an additional impact on Harbour ecosystems and water quality. | Protect marine flora and fauna from adverse environmental impacts. | Any proposal to dredge portions of Princess Royal Harbour must be referred to the EPA for environmental impact assessment. | No dredging is proposed. The proponent has undertaken a commitment to monitor water depth in the vicinity of the redevelopment site on a bi-annual basis for a period of five years following construction. | Proponent's commitment noted. |
| Proposed reclamation will result in the loss of an area of seagrass meadow of between 2.4 to 3.6 ha. | Protect marine flora from adverse environmental impacts. | Proposed reclamation will result in a direct loss of seagrass. | Seagrass loss is considered to be acceptable by the proponent. A commitment has also been undertaken to confine filling operations to autumn winter and spring to avoid critical growth periods for seagrass. | Proponent modify and reduce extent of proposed reclamation adjacent to the Western Precinct to minimise damage to seagrass meadows to the satisfaction of the Environmental Protection Authority with advice from the Albany Waterways Management Authority.<br><br>Operational months should be clearly specified, as summer and early autumn are critical growth periods. |

| | | | | |
|---|---|---|---|---|
| Loss of a marine habitat which will impact on fish species | Protect marine fauna from adverse environmental impacts. | There will be some loss of marine habitat. This is considered to be acceptable provided impact on seagrass meadows is reduced. | Some loss of marine habitat is considered to be acceptable by the proponent. | Refer to EPA view on seagrass above. |
| Impact on local water hydrodynamics and sediment movement | Ensure that development does not have a significant impact on existing coastal processes. | The proposed Redevelopment, particularly in the vicinity of the Western Precinct, is likely to interrupt sediment dynamics. It is acknowledged that design will be modified to minimise disturbance to seagrass. Final design of Western Precinct will have an impact on sediment dynamics and should be undertaken in consultation with AWMA and DOT. | A commitment has been undertaken to design the headland to the satisfaction of the DOT. | The final design of the Western Precinct component of the proposed redevelopment be undertaken so as to reduce te interruption of off-shore sediment movement, in consultation with the AWMA and DOT. |
| Impact on water quality within Princess Royal Harbour as a result of stormwater discharge | Ensure that water quality within Princess Royal Harbour is maintained to an acceptable standard. | It is noted that a stormwater management system is proposed. This issue can be appropriately managed by the proponent in consultation with the AWMA, the Town of Albany and the DOT. | A stormwater management system will be designed to manage stormwater discharge into Princess Royal Harbour in consultation with the Town of Albany and DOT. | Managed by proponent's commitments in consultation with AWMA, Town of Albany and DOT. |
| Redevelopment site known to be contaminated as a result of previous land uses. | Ensure that soils on the site do not have an adverse impact on people living or visiting the site. | Additional information regarding extent and nature of contaminated soils on the development site has been provided by the proponent. This information concludes that contaminated soils are present at the site, and would be removed off-site as part of earth works associated with the proposed redevelopment. | A commitment has been undertaken to dispose of contaminated soil to the satisfaction of the Town of Albany. The existing tip site at Hanrahan Road was identified as a possible site for the disposal of contaminated material. | The suitability of the Hanrahan Road Tip site for the disposal of contaminated soil should be further investigated with the Department of Environmental Protection to ensure that it complies with appropriate landfill criteria. |

| | | | | |
|---|---|---|---|---|
| Groundwater beneath the development site is contaminated from an unknown, off-site source. | Ensure that groundwater beneath and discharging from the site does not have an adverse impact on Princess Royal Harbour and people living or visiting the site. | Results on the nature and extent of groundwater contamination indicates that groundwater flowing towards the Harbour beneath the site is contaminated to varying degrees. The source of groundwater contamination is unclear. Several concerns remain about:<br>• the source of groundwater contamination and whether this situation is likely to worsen;<br>• the risk of exposure of people living on the site to the contaminated groundwater; and<br>• the impact of the contaminated groundwater on the nearshore marine environment. | It is considered that contaminated groundwater discharging into Princess Royal Harbour would be rapidly diluted and will not pose a threat to water quality in the harbour. The source of groundwater contamination is considered to be off - site. Commitments are made to manage dewatering activities during site development to minimise risk of exposure of site workers to contaminated groundwater, and to prevent the use of groundwater for potable purposes following completion of development until the groundwater quality is considered to be of an acceptable standard. | The source of groundwater contamination prior to development of the site be identified through investigation co-ordinated by the DEP.<br><br>The nature of the source of groundwater contamination should be determined as soon as possible, to determine the degree of contamination, and whether rates of contamination are likely to increase.<br><br>Dewatering activities associated with the construction of the proposed development should be managed in such a way so as to avoid direct human contact with groundwater or direct discharge into Princess Royal Harbour, to the satisfaction of the DEP.<br><br>No abstraction of the groundwater should take place on the proposed development site following the construction phase of the development.<br><br>No structures should be constructed below ground on the development site, except for building footings and normal infrastructure. |

| | | | | |
|---|---|---|---|---|
| Potential temporary impact on water quality within the vicinity of the reclamation site. | Ensure that water quality within Princess Royal Harbour during the reclamation phase is maintained to an acceptable standard. | Turbidity associated with land reclamation is unlikely to have a significant long term adverse long term impact on water quality within Princess Royal Harbour. | It is acknowledged that there will be a short term impact on water quality within the marine environment. Commitments are proposed to help reduce these impacts during the reclamation phase of the development. The proponent intends to monitor the impacts of reclamation, in consultation with the AWMA. | The Fisheries Department and Albany Waterways Management Authority should be consulted regarding the monitoring of impacts of reclamation on water quality within Princess Royal Harbour prior to and during the construction phase of the development. |
| Impact of noise from heavy vehicles and trains on future residents of the Foreshore Redevelopment site. | Ensure that noise levels experienced by residents on the proposed development site from heavy vehicles and trains are maintained within acceptable limits. | Additional commitments have been forwarded in relation to the impact of noise originating from road and vehicle traffic on residents of the foreshore redevelopment. However, these relate to a third party and therefore can only be implemented as a planning condition. | A commitment is undertaken to comply with a 50 dB $L_{Amax}$ for noise from any rail activities between 2200 hours and 0700 hours, and an internal noise standard of 35 dB $L_{Aeq}$ over any fifteen minute period between 2200 hours and 0700 hours in bedrooms for road and rail traffic. These levels would be achieved through the enforcement of specific development conditions. | The DEP should liaise closely with the Ministry for Planning to ensure that the proponent complies with all specified development conditions, and that the commitment to noise control during the rezoning and subdivision phase of the development is recognised through the planning approval process. |
| Proposed residential development in close proximity to existing Port operations may restrict long term plans for Port expansion. | Ensure that the proposed redevelopment does not compromise long term operations of the existing Port. | There is uncertainty related to the risks associated with potential materials being imported and exported through the Port of Albany and the fact that Princess Royal Drive is the only heavy vehicle access into the Port. It is acknowledged that this is unlikely to be an issue for the next 25 years, and is therefore considered to be environmentally acceptable at this time. However, if Port cargo projections change and hazardous or dangerous goods are introduced through the Port, the proposal may constrain long term Port operations. This issue will be the subject of on - going discussion between the EPA and the WAPC. | It was considered that this issue lies outside the responsibility of the proponent. | Consideration should be given by State Government to the likelihood that this proposal may constrain the potential growth of the Port of Albany with respect to some forms of cargo. |

| | | | | |
|---|---|---|---|---|
| Potential risk associated with the handling of hazardous cargo at the Port in view of close proximity of proposed urban development. | Ensure that risk to future residents and visitors of the redevelopment site meets acceptable criteria, in view of the close proximity of the Albany Port. | There is an issue of public safety in view of the close proximity of the proposed urban development to Princess Royal Drive. | A setback distance of between 15 and 30 metres is considered to be adequate to ensure there is no risk to public safety as a result of heavy vehicles travelling to and from the Port of Albany. | The proponent should in consultation with the Department of Minerals and Energy, define and implement an appropriate setback distance between residential dwellings and Princess Royal Drive, to ensure that there is no risk to public safety, prior to the development of the Precinct plans, to the satisfaction of the EPA. |
| Road and rail traffic generated as a result of on-going Port operations is considerable, and may present a risk to public safety for pedestrians wishing to gain access to the foreshore development. | Ensure that the safety of pedestrians travelling to and from the proposed redevelopment site is maintained. | A significant increase in vehicle and pedestrian traffic would be generated as a result of the foreshore redevelopment. There is a long term risk for residents living in close proximity to the Port access road when it is eventually upgraded to a 4 lane dual access road to the Port. | Studies undertaken by the proponent indicate that this is not a significant issue as long term projections indicate low volumes of traffic both to the Port and the Foreshore Redevelopment site. | This is a public safety issue which should be addressed by the MRD, the Town of Albany and Landcorp as proponent. |

In reaching this conclusion the Environmental Protection Authority identified the main environmental issues requiring detailed consideration as:

- dredging and reclamation of a portion of Princess Royal Harbour;
- impact on marine flora and fauna;
- impact on off-shore coastal processes;
- impact on water quality within Princess Royal Harbour;
- stormwater management;
- soil contamination
- groundwater contamination;
- noise management;
- constraint to future Port development; and
- risks and hazards.

Recommendation 2

The Environmental Protection Authority recommends that the proponent should modify and reduce the area of reclamation adjacent to the Western Precinct, to minimise damage to seagrass meadows, to the satisfaction of the Environmental Protection Authority, with advice from the Albany Waterways Management Authority.

Recommendation 3

The Environmental Protection Authority recommends that the final design of the Western Precinct component of the proposed redevelopment should be undertaken so as to reduce the impact on off-shore sediment movement, in consultation with the Albany Waterways Management Authority and the Department of Transport, to the satisfaction of the Environmental Protection Authority.

Recommendation 4

The Environmental Protection Authority recommends that the suitability of the Hanrahan Road Tip site for the disposal of contaminated soils should be further investigated by the proponent with the Department of Environmental Protection to ensure that it complies with appropriate landfill criteria.

Recommendation 5

The Environmental Protection Authority recommends that the source of groundwater contamination should be identified through investigation co-ordinated by the Department of Environmental Protection prior to site development and a management plan be prepared and then implemented.

Recommendation 6

The Environmental Protection Authority recommends that the nature of the source of groundwater contamination should be determined as soon as possible, to determine the degree of contamination, and whether the rates of contamination are likely to increase.

**Recommendation 7**

**The Environmental Protection Authority recommends that dewatering activities associated with the construction of the proposed development should be managed in such a way so as to avoid direct human contact with groundwater or direct discharge into Princess Royal Harbour, to the satisfaction of the Department of Environmental Protection.**

**Recommendation 8**

**The Environmental Protection Authority recommends that no abstraction of groundwater should take place on the proposed development site following the construction phase of the development.**

**Recommendation 9**

**The Environmental Protection Authority recommends that no structures be constructed below ground on the development site, except for building footings and normal infrastructure.**

**Recommendation 10**

**The Environmental Protection Authority recommends that the Fisheries Department and the Albany Waterways Management Authority be consulted regarding the monitoring of impacts of reclamation on water quality within Princess Royal Harbour prior to and during the construction phase of the development.**

**Recommendation 11**

**The Environmental Protection Authority recommends that consideration should be given by State Government to the likelihood that this proposal may constrain the potential growth of Albany with respect to some forms of cargo.**

**Recommendation 12**

**The Environmental Protection Authority recommends that the proponent should in consultation with the Department of Minerals and Energy, define and implement an appropriate setback distance between residential dwellings and Princess Royal Drive, to ensure that there is no risk to public safety, prior to the development of the Precinct plans, to the satisfaction of the EPA.**

# 6. Recommended environmental conditions

Based on the assessment of this proposal and recommendations in this report, the Environmental Protection Authority considers that the following Recommended Environmental Conditions are appropriate:

**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 in response to issues raised following public submissions; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

A schedule of those Environmental Management Commitments (October 1995) which will be audited by the Department of Environmental Protection was published in Environmental Protection Authority Bulletin 800 (Appendix 5) and a copy is attached.

## 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 Seagrass Meadows Recommendation 2

4-1 The proponent shall minimise damage to seagrass meadows in Princess Royal Harbour.

4-2 To achieve the objective of condition 4-1, prior to commencement of earthworks, the proponent shall modify the Western Precinct designs to reduce the area of reclamation adjacent to the Western Precinct, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Albany Waterways Management Authority.

4-3 The proponent shall implement the modified design required by condition 4-2.

## 5 Sediment Movement Recommendation 3

5-1 The proponent shall reduce the impact of off-shore sediment movement accumulation adjacent to the Western Precinct.

5-2 To achieve the objective of condition 5-1, prior to commencement of earthworks, the proponent shall modify the final design of the Western Precinct component of the redevelopment in consultation with the Albany Waterways Management Authority and the Department of Transport, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

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

## 6 Disposal of Contaminated Soils Recommendation 4

6-1 Prior to commencement of earthworks, the proponent shall investigate the suitability of the Hanrahan Road Tip site for the disposal of contaminated soils in consultation with the Waste Management Division of the Department of Environmental Protection to ensure that it complies with appropriate landfill criteria.

6-2 The proponent shall only dispose of contaminated soils in a site which has been identified as environmentally acceptable in the opinion of the Minister for the Environment on advice of the Department of Environmental Protection, following consultation with the Waste Management Division of the Department of Environmental Protection as required by condition 6-1.

## 7 Groundwater Recommendation 5

7-1 Prior to commencement of earthworks, the proponent shall investigate and identify the source of groundwater contamination in collaboration with the Department of Environmental Protection.

Recommendation 6

7-2 Prior to commencement of earthworks, the proponent shall determine the nature of the source of groundwater contamination, the degree of contamination, and whether the rates of contamination are likely to increase.

7-3 Prior to commencement of earthworks, the proponent shall prepare an Environmental Management Programme which incorporates the findings arising from conditions 7-1 and 7-2, and which addresses the construction and future management phases for the site, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

7-4 The proponent shall implement the Environmental Management Programme required by condition 7-3.

Recommendation 7

7-5 The proponent shall manage dewatering activities associated with construction in such a way as to avoid direct human contact with groundwater or direct discharge into Princess Royal Harbour.

Recommendation 8

7-6 Following the construction phase, the proponent shall not permit abstraction of groundwater on the site.

Recommendation 9

7-7 Except for building footings and normal infrastructure, the proponent shall not construct or build structures below ground level on the site.

## 8 Water Quality within Princess Royal Harbour Recommendation 10

8-1 The proponent shall ensure that the proposal does not have an adverse impact on the beneficial uses of the waters of Princess Royal Harbour.

8-2 Prior to construction, the proponent shall prepare a programme for monitoring of impacts of reclamation on water quality within Princess Royal Harbour, in liaison with the Fisheries Department and the Albany Waterways Management Authority.

8-3 Prior to construction, the proponent shall implement the monitoring programme required by condition 8-2.

**9 Setback Distance** Recommendation 13

9-1 To ensure that there is no risk to public safety, prior to the final design of the Precinct plans, the proponent shall, in consultation with the Department of Minerals and Energy, define an appropriate setback distance between residential dwellings and Princess Royal Drive, to the requirements of the Minister for the Environment on advice of the Department of Environmental Protection and the Department of Minerals and Energy.

9-2 The proponent shall implement the setback distance requirements between residential dwellings and Princess Royal Drive resulting from condition 9-1.

**10 Time Limit on Approval**

The environmental approval for the proposal is limited.

10-1 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 Department of Environmental Protection that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years.

**11 Compliance Auditing**

To help determine environmental performance, periodic reports on progress in implementation of the proposal are required.

11-1 The proponent shall submit periodic Progress 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.

# 7. References

Albany Port Authority (unpublished)'Report on Port Access'.

Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council (1992) Australian and New Zealand Guidelines for the assessment and management of contaminated sites.

Environmental Protection Authority (1987) An overview of environmental problems in Princess Royal Harbour and Oyster Harbour, Albany, with a discussion of management options. Technical Series No. 16

Environmental Protection Authority (1990) Albany Harbours Environmental Study 1988 - 1989. A Report to the EPA from the Technical Advisory Group. Bulletin 412

Environmental Protection Authority (1990) Albany Harbours Environmental Study 1988 - 1989 - Summary and Recommendations. A Report to the EPA from the Technical Advisory Group. Bulletin 426

Environmental Protection Authority (1992) Criteria for the assessment of risk from industry - Environmental Protection Authority Guidelines. Bulletin 611.

Environmental Protection Authority (1995) Bunbury Harbour City - Marlston Hill development - proposed changes to environmental conditions. Report and Recommendations of the Environmental Protection Authority. Bulletin 774.

ERM Mitchell McCotter Pty Ltd (1995) 'Albany Foreshore Redevelopment Project' Consultative Environmental Review.

ERM Mitchell McCotter Pty Ltd (1995) 'Albany Foreshore Site Assessment' Report 95W32RP1 (commissioned by Landcorp).

Government of Western Australia (1992) 'State of the Environment Report'.

Halpern Glick Maunsell (1995) Albany Foreshore Development Port Access Study. Report S3448C (commissioned by Landcorp).

ICI Engineering Pty Ltd (1995) Truck Transport Risk, Princess Royal Drive, Albany Foreshore Redevelopment'. Unpublished (commissioned by Landcorp).

Kirkman, H (1983) 'Mapping of underwater seagrass meadows' in Proceedings of Symposium of Remote Sensing of the Coastal Zone of Geographic Information. 5 A2.1.- 2.9. Kirkman, H. Oliver, L. and Digby, B.

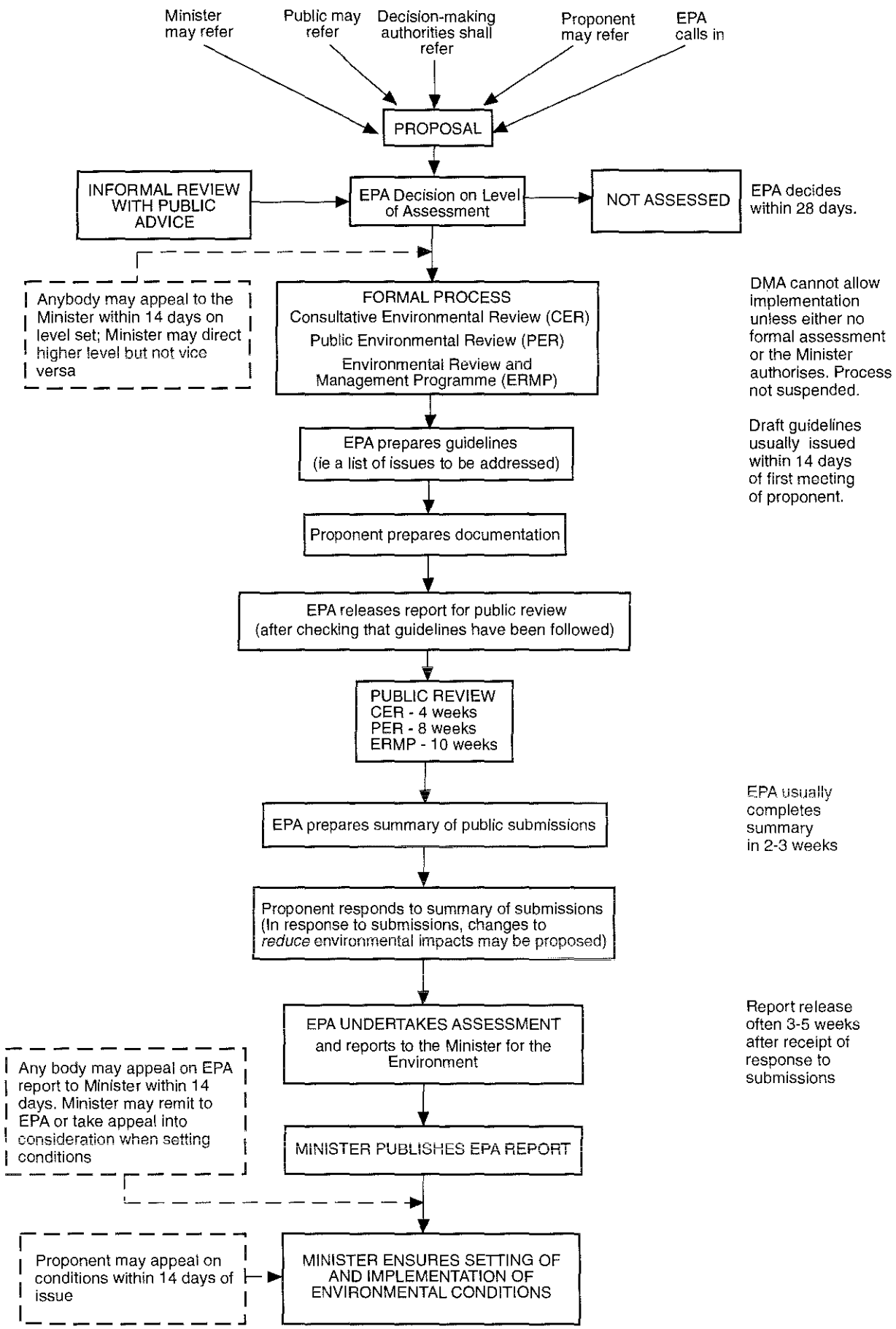
Waterways Commission (1994) Albany Waterways Management Authority - Draft Albany Waterways Management Programme. Report No. 45.

Wood and Grieve Engineers (1994) Geotechnical and Site Contamination Investigation - Albany Foreshore Precinct.(commissioned by Landcorp).

# Appendix 1

## Environmental Impact Assessment flow chart

# EIA PROCESS FLOW CHART



# Appendix 2

## Summary of public submissions

# PROPOSAL TO REDEVELOP LAND FOR RESIDENTIAL, TOURIST AND COMMERCIAL USE, ALBANY FORESHORE - CONSULTATIVE ENVIRONMENTAL REVIEW

## ISSUES RAISED IN PUBLIC SUBMISSIONS

The public submission period for the Consultative Environmental Review (CER) for the above proposal commenced on 20 February 1995 for a period of four weeks, ending on 17 March 1995.

A total of 12 submissions were received by the Authority. These included 3 letters from individual members of the public, and submissions from the following agencies and organisations :

Fisheries Department of WA
Albany Waterways Management Authority
Town of Albany
Department of Transport
WA Tourism Commission
Main Roads Department
Water Authority of Western Australia
Westrail
Conservation Council

A number of issues were identified in submissions and are summarised under the following headings :

1. Stormwater management
2. Disposal of contaminated soil
3. Noise management
4. Traffic management
5. Risk management
6. Reclamation and reclamation management
7. Impact on Seagrass
8. Dredging
9. Sewerage management
10. Impact on recreational use of the foreshore and existing beaches
11. Native Title Claim
12. Conflict of development
13. Town Jetty
14. Privatisation of the foreshore

### 1. Stormwater management

1.1. Sedimentation tanks described within the CER document should be designed to ensure easy access and maintenance, particularly as the sediment pits may require large vehicle access, to then satisfaction of the local authority.

1.2. Stormwater drainage should be diverted away from the enclosed area south of the Town Square Precinct. It may be possible to divert water to the lakes to the west or east of the jetty, to avoid sediment build up in front of the Town Square Precinct.

1.3. It is suggested that the design of the stormwater / urban drainage system be reviewed in consultation with representatives of the Department of Transport, for example detailed location of the drainage sedimentation chambers, management local groundwater flow and levels.

1.4. It is claimed that concrete structures proposed as part of the stormwater management would be difficult to maintain. It was suggested that it may be possible to use the embayment at the southern end of the Town Square for the deposition of nutrients and contaminates. The embayment could be easily cleared of accumulating sediments using standard earth moving equipment.

1.5. The use of a 'sedimentation lake' within the development proposal is encouraged and supported. It was claimed that a 'suitably designed artificial wetland' would remove sediments from urban run - off, strip nutrients by use of suitable fringing vegetation, provide a natural continuity between the terrestrial and marine systems, be an added visual attraction to the foreshore redevelopment, act as a containment in the event of a major pollution spill, and remove any litter, provided it is suitably designed.

## 2. Disposal of contaminated soil

2.1. The CER states that 14,900 $m^3$ of contaminated spoil would be transported to the Hanrahan Road refuse site. This will reduce the life on the refuse site. The view was expressed that an alternative disposal site, such as the clay pits at the Albany Brick works may be more acceptable.

## 3. Noise management

3.1 The CER examines the exiting noise level over a one day period for two 15 minute samples, but for example, it makes no mention of noise due to rail operations, which are on-going 24 hours per day, and will continue on this basis. The sample period is considered to be too small for the noise environment study. It was pointed out that noise originating from rail operations has been identified as a problem in the past, and increasing the population density in the area will exacerbate an already existing problem.

3.2. It is noted that the Draft Environmental Protection (Noise) Regulations do not provide guidelines for assessing emissions from road or rail traffic 'subject to ratification by the executive of the organisation'. Westrail raises the point that it will soon implement an Environmental Management Strategy (EMS) , which will address amongst other issues noise. Noise emissions from, for example freight trains, would be addressed in this context.

3.3. Noise management issues within the CER only covers the issue of noise with respect to road traffic, in the pre-construction phase. Noise levels could increase with heavy vehicle movement into the Port (carrying for example wood chips), and noise levels could therefore be expected to increase.

3.4. The issue of noise from rail operations may be adequately addressed through building design. The suggestion was made that these should be determined following consultation with the Department of Environmental Protection to avoid delays in the processing of development applications.

## 4. Traffic management

4.1. It was claimed that traffic growth along Princess Royal Drive is underestimated in the CER. Additional traffic will be generated as a result of the development itself.

4.2. Concern was expressed that the 'right of access' to the Port for heavy haulage must always be protected as there is no alternative means of vehicle access The need to take the road to dual access 4 lane road should therefore be protected and maintained and should be addressed as part of the traffic management contingency by the proponent within the CER document.

4.3. It is noted that the commitment to manage traffic congestion is restricted to the construction phase only. It was suggested that this should be extended to post construction, to account for the steady increase in freight movements to the Port, accessing the development and passing

through the development area, in accordance with the ROADS 2020 Strategy for the region. It is considered important that traffic is appropriately managed to ensure long term access to the Port is not jeopardised.

## 5. Risk management

5.1. It is acknowledged that a risk analysis was undertaken as part of the preparation of the CER document. However, this does not consider the risk imposed by the rail traffic running parallel with the northern boundary of the Study Area. Concern was expressed that by increasing the appeal of the area and including a residential area, the risk of a train - road vehicle accident increases at nearby road crossings.

5.2. Public safety issue. How will pedestrians safely traverse the existing railway line (other than by proposed overhead footbridge) and existing crossings, especially between the areas from York Street and the Town Square precinct, which is likely to generate a large amount of pedestrian traffic. This issue needs to be adequately addressed.

## 6. Reclamation and reclamation management

6.1. The shape of the redevelopment area creates a number of environmental problems, i.e. :

• Extension to Precinct A into the Harbour will result in direct loss of seagrass bed; and
• provision of a basin in front of the Town Square Precinct will encourage retention of sediment deposited from stormwater, littoral drift and litter.

In view of these concerns it may be appropriate to redesign the shape of reclamation. This could be achieved by a uniform extension into the harbour, and alleviate the above mentioned problems.

6.2. Extension of reclamation into the Harbour in the Western Precinct appears to be for 'predominantly residential land use' (CER p. 2.4). This is not a reason to justify reclamation of the Harbour, especially where it will directly affect seagrass. The shape of this Precinct should be reconsidered to minimise extent of reclamation and consequent direct environmental impact.

6.3. A detailed Reclamation Management Plan should be prepared by the proponent, to ensure that sediment plumes generated do not impact on other parts of the harbour, to the detriment of seagrass and other biota. The Plan should address the following issues :

• a description of earth to be used as temporary bunds. Use of rocks for bunding is suggested by both the Albany Waterways Management Authority and Fisheries Department;
• use of mesh nets or sediment curtains to restrict sediment movement during reclamation operations;
• 'discharge channels' to be near the surface water level so that the bunded areas can act as a 'detention basin' and the coarser gained material not easily exported; and
• a description of the nature of material proposed to be used for reclamation (and minimum standards set).

6.4. The proponent should undertake a commitment that 'all reclamation shall be undertaken during winter months' to minimise impact on water quality as a result of turbidity associated with reclamation activities.

6.5. Proposed reclamation may have an unacceptable impact on tidal flows within Princess Royal Harbour, which may exacerbate already existing environmental problems within the Harbour.

## 7. Impact on Seagrass

7.1. The CER estimates that approximately 3.26 hectares (ha) of seagrass will be lost. This is claimed to be insignificant compared with the 291 ha of seagrass (with a density of 15 - 75 %) which exists in Princess Royal Harbour. However, this loss will result in the removal of seagrass meadows which are known to form the basis of a complex food chain, and is especially important as a fish habitat. Further loss of this habitat will be critical for many animal species.

It was considered that the loss of seagrass as a result of this development should be put in context, i.e. over 90% of seagrass cover in the Harbour has disappeared since 1962. Recent research by the Albany Waterways Commission suggests that further seagrass loss is likely as a result of smothering by macroalgae. There is no quantifiable evidence of the impact of the loss of this particular area. The cumulative effect of seagrass loss needs to be considered. Further loss of seagrass is considered to be unacceptable. Two submissions clearly expressed the view that the redevelopment plan should be reviewed so that there is no loss of seagrass community.

7.2. One submission stated that removal of seagrass should be kept to the minimum identified within the CER, i.e. 2.4 ha rather that 3.6 ha. The use of both these figures in the CER document is considered to be misleading.

7.3. If redevelopment is allowed to impinge on seagrass areas, the proponent should endeavour to limit seagrass recession, particularly by avoiding turbidity arising from spread of sediments during the construction phase. Further, the proponent should be required to financially contribute to seagrass recovery in other areas of the Harbour.

7.4. The proponent should be required to monitor the impacts of the reclamation on adjacent seagrass communities in consultation with the Albany Waterways Management Authority over a 5 year period following construction. This monitoring should begin 12 months prior to any works being undertaken and include reference to light intensity, sediment accumulation and coverage of seagrass, so that a true assessment of the environmental impact of reclamation can be made.

7.5. Claims and implications made within the CER document that remnant seagrass is stable and should somehow regenerate (p. 3.10 and 3.11) are dangerous and ill - informed. Further, while taking into account the projected decrease in nutrient levels from existing industries, the CER fails to make mention of issues such as possible impacts of increased Port activities (ballast and dust from loading ships), dust and run off from woodchip stockpiling and dust from Silica Sands, oil and petrol run-off from increased road and rail traffic, increased production from Vital Foods (who have yet to meet existing interim targets), possible groundwater contamination from oil / fuel storage and small handling spills, increasing urban pressure around the harbour, increased septic tank usage from domestic and industrial developments, and continuing nutrient rich run off from the Albany sale yards. It is therefore misleading to claim that seagrass meadows will recover, without more long term research or evidence.

7.6. Concern was expressed that the relatively large dense area of seagrass west of the development area will be adversely affected by changes to water flow resulting from the reclamation. Changes such as this may lead to a substantial collapse in the ecology of the Harbour.

## 8. Dredging

8.1. The CER states that no dredging will be required, however it is likely that a redeveloped foreshore will increase demand to boating activities to the new foreshore alignment, which is likely to lead to a dredging application. This issue should be addressed in the overall context of the CER document, so all environmental impacts can be adequately identified and addressed.

8.2. Dredging may be required to maintain water depths adjacent to the new foreshore alignment. This issue has not been adequately addressed within the CER document.

8.3. Every effort should be made to stop sedimentation associated with construction of groynes and breakwaters, as it is obvious that these structures are likely to lead to on-going maintenance dredging in the future. Figure 1.2 in the CER illustrates this fact, by showing the present impact of the groyne with sediments accumulating on the western side.

## 9. Sewerage management

9.1. The CER states that in relation to sewerage management, 'if gravity flow is not possible, a second pumping station may be required'. If this is the case, the proponent should undertake a commitment to provide emergency overflow storage with the pump station to minimise risk of overflow to Princess Royal Harbour (to the satisfaction of the Water Authority of Western Australia).

9.2. It is unclear whether the proponent (and Albany Town Council) has approached the Water Authority of WA regarding linking the effluent disposal to the new sewerage system

## 10. Impact on recreational use of the foreshore and existing beaches

10.1 The CER (p. 4.6) makes reference to the construction of a beach on the Western Precinct. This issue has not been adequately addressed and requires more detail, for example, proposed location, length, method of construction, source material, and maintenance.

10.2. Concern was expressed that residential development up to the western extremity of the Project site may impinge upon recreational use of the proposed beach.

## 11. Native Title Claim

11.1. It is noted that the issue of Native Title Claim' has not been addressed within the CER document. Clarification of this issue would need to be undertaken as part of any development proposal for the foreshore area.

## 12. Conflict of development

12.1. One submission expressed the view that this proposal cannot be assessed in isolation of the proposed Albany Port Development. It is considered that this CER would be *'null and void'* as soon as the Port begins its proposed works, as this will have an impact on water quality in the immediate Harbour environment.

It is considered that the entire region of Princess Royal Harbour, including all foreshore development should be subject to major environmental and planning studies before any approvals for development are granted.

## 13. Town Jetty

13.1. Concern was expressed in one submission that the Town Jetty not be replaced by a breakwater as 'this will be to the detriment of the Harbour 'sea floor', and also detract from the tourist and heritage value of the area.

## 14. Privatisation of the foreshore

14.1. It is understood that the foreshore development would involve the transfer of approximately one third of this public land into private ownership. This is strongly opposed in one submission. 'Numerous reports on the coastal zone have identified that Australians wish the waterfront to remain in public ownership with full public access'. Public access along the waterfront should not be restricted.

# Appendix 3

**Proponents response to issues raised within public submissions**

# PROPOSAL TO REDEVELOP LAND FOR RESIDENTIAL, TOURIST AND COMMERCIAL USE, ALBANY FORESHORE CONSULTATIVE ENVIRONMENTAL REVIEW

## RESPONSE TO PUBLIC SUBMISSIONS

## LANDCORP

### 1 Stormwater Management

1.1 Commitment 1.5.5 specifically states that the sedimentation tanks will be constructed to the satisfaction of the Town of Albany *"to ensure that adequate access is provided for maintenance purposes"*.

1.2 The stormwater management system is designed to discharge into the embayment in front of (to the south of) the Town Square Precinct. Baffles, litter traps and sedimentation traps will be put in place to the satisfaction of the Town of Albany. These facilities will prevent sediment from the drain catchments entering the Harbour.

1.3 It is currently stated that the stormwater management system will be designed to the satisfaction of the Town of Albany. The Department of Transport could be consulted during the design process if they wish to be involved.

1.4 See 1.1 above. Using the embayment at the southern end of the Town Square Precinct for improving water quality is not recommended because:

a) once pollutants reach the embayment they are effectively in the environment. By using stormwater management facilities such as sedimentation traps, the opportunity to control pollution is available further "upstream"; and

b) using earth moving equipment on a regular basis in the embayment for maintenance would possibly generate turbidity which should be avoided where possible.

1.5 A "sedimentation lake" is not being proposed as part of the development. The measures being proposed of sedimentation tanks, baffles and litter traps should improve the stormwater quality markedly as the current drains discharge directly into the Harbour.

### 2 Disposal of Contaminated Soil

2.1 If an alternative site for the disposal of the contaminated wastes exists, then this option could be investigated. Because of the nature of the material as described in Section 3.1.2 in the CER, site selection would need to take into account the end use of the area to be filled. Under Commitment 1.2.3 the proponent has undertaken to move the material to the Hanrahan Road Tip to the satisfaction of the Town of Albany.

Negotiations with the Town of Albany regarding this issue can be undertaken via this commitment.

## 3 Noise Management

3.1 The existing noise levels are used in the CER for the purpose of formulating road traffic and train unloading criteria. In the event of road traffic noise, these criteria are not used in preference to a more stringent standard, on advice from the DEP. For train unloading noise, the criteria is that the $L_{10}$ noise level due to the source should not exceed $L_{90}$ background noise level by more than 5dB. Given that the measured night time $L_{90}$ was 40 dB(A), the criteria was set at 45 dB(A) (40 + 5). If, as suggested, background noise was measured when trains were operating, the background night time $L_{90}$ would have been higher thus setting the criteria at a higher level. Therefore, it is considered that the background noise measurements although having a small sampling period are conservative.

3.2 Issue raised by Westrail has been noted.

3.3 Noise levels due to road traffic are calculated on the basis that traffic to the port increases in the future (Section 4.7.3), and not based on pre-construction traffic. Calculations are based on the Sinclair Knight Merz report on future traffic volumes.

3.4 Design guidelines for noise management in residential buildings have been provided in precinct plans for the development. These guidelines are as follows:

Residential buildings adjacent to Princess Royal Drive shall be designed to provide an internal noise level of 35 dB(A) from sources associated with train unloading. This would also provide acceptable internal noise levels sourced from traffic on Princess Royal Drive.

Treatments required to achieve this internal noise level will depend on the design of individual buildings. However as a guide this would require:

- use of external glazing at least eight millimetre thick. This may be able to be opened, but must be closed to achieve the required attenuation;
- installation of air conditioning or mechanical ventilation, to allow windows to remain closed; and
- some additional treatment to the roof-ceiling may also be required.

Liaison will occur with the Department of Environmental Protection should more detailed design guidelines be required.

## 4 Traffic Management

4.1 It is anticipated that the total traffic generated by the development will be in the order of 7000 vehicles per day (Sinclair Knight Merz, 1994). Some of these vehicle trips will be contained on site, as circulation within the development is completely self contained. The combined 24 hour forecasts at the intersection of Princess Royal Drive and York Street are:

- Princess Royal Drive 7,700-8,000vpd
- York Street 3,000-5,000vpd

These traffic volumes have been taken into consideration in the calculation of future traffic volumes along Princess Royal Drive.

4.2 The existing road reserve for Princess Royal Drive is currently wide enough to accommodate a dual access four lane divided road should it be required. The 'need to take the road to dual access' is therefore protected by the width of the road reserve that is already in place. The planned development of the foreshore would not impede the construction of this road.

4.3 As traffic generated by the development has been included in the calculation of future traffic volumes, it is not anticipated that future traffic management will be required in the area. The allowance to widen Princess Royal Drive to four lanes should ameliorate any future traffic congestion.

## 5 Risk Management

5.1 The amount of traffic crossing the rail line at the bottom of York Street will increase as a result of the development by making the foreshore more attractive and providing recreational, commercial and residential opportunities. However, the risk is still not considered by the proponent to be significant and can be managed by appropriate road and level crossing design. For example the current flashing lights at the bottom of York Street could be replaced by a boom gate.

5.2 As with traffic, increased pedestrian movement will occur as a result of the development. Pedestrians will be able to cross the rail line safely either via the overhead footbridge or possibly by a pedestrian maze at the road vehicle level crossing.

## 6 Reclamation and Reclamation Management

6.1 The proposal has been designed in its current shape to take advantage of several important viewlines in the area and to create the basin to the south of the Town Square Precinct. The basin has been designed as a significant water feature that is important to this development and the view down York Street and across the Town Square Precinct.

The issues of stormwater, sedimentation and litter have been addressed in Section 1.

6.2 Residential development is an essential component of planning for any community. This location provides a unique opportunity to provide high quality residential development in close proximity to one of the worlds great natural harbours. The key environmental impact is loss of seagrass. Given:

a) the relatively small area of seagrass that will be lost; and

b) the environmental improvements of stormwater management and contaminated site remediation;

the proponent feels the proposal is a good balance between environmental impact and maximisation of development opportunities in a unique location. This issue is discussed more in Section 7. There is some scope for changing the design of the headland in the Western Precinct to minimise sedimentation in the basin.

6.3 Commitment 1.5.2 refers to the development of a fill placement program in consultation with AWMA. Whilst not called a "Reclamation Management Plan", the aims of minimising turbidity and sedimentation are the same. The issues raised in this point can be addressed with AWMA through this existing commitment. Commitment 1.5.3 specifically states that sediment curtains will be used to AWMA's satisfaction.

6.4 The proponent has undertaken to attempt to confine filling operations to autumn, winter and spring (March-November) in Commitment 1.3.2 to avoid the critical growth period for seagrass. This combined with Commitment 1.5.3 should avoid impacts on seagrass from sedimentation.

6.5 Given the size and shape of the reclamation area relative to the Harbour in total, there is expected to be little or no impact on tidal flows.

## 7 Impact on Seagrass

7.1 The comments regarding seagrass loss are noted. The proponent has stated in the CER that the relative amount of seagrass loss is small, and given the additional environmental and community benefits of the proposal, the loss is acceptable. The environmental benefits of the proposal include:

a) removal of contaminated soil which might otherwise pollute the Harbour through leaching; and

b) treatment by sedimentation of stormwater which is currently untreated.

The decision must now be made by the Environmental Protection Authority and Minister for the Environment as to whether the loss of seagrass is environmentally acceptable.

7.2 It is possible that some people found the use of the two figures misleading. The proponent can now confirm that reclamation will be limited to that shown in Figure 2.1 as "Extent of Proposed Reclamation". This means reclamation will not be undertaken right out to the precinct boundary. The figures for seagrass loss are as follows:

Worst Case

| | |
|---|---|
| Direct loss due to reclamation | 0.42 ha |
| Seagrass Recession (77 m) | 2.84 ha |
| TOTAL | 3.26 ha |

Best Case

| | |
|---|---|
| Direct loss due to reclamation | 0.42 ha |
| Seagrass Recession (33 m) | 2.06 ha |
| | 2.48 ha |

In the worst case situation, only 36% or 1.16ha of the seagrass removed is at the higher quality 45-75% density. In the best case situation, only 35% or 0.88ha of the seagrass removed is at the higher quality 45-75% density.

The best and worst case seagrass recession figures are best estimates based on current recession trends of seagrass on the foreshore of Princess Royal Harbour in the vicinity of the foreshore redevelopment. The most likely recession distance will be somewhere between the two figures.

7.3 The proponent has committed to a number of measures to avoid turbidity and sedimentation during construction. See response to issues in Section 6.

The proponent would argue that they are already contributing to environmental management and seagrass recovery by instituting a proper stormwater management system and removing contaminants which may otherwise enter the Harbour. Thus it believes the requirement is inequitable.

7.4 In Commitment 1.3.9 the proponent has committed to monitoring for 5 years to the satisfaction of the DEP. The commencement of the monitoring will be dependant on the overall timing of approvals for the project. Baseline surveys of the existing situation will be carried out as part of this monitoring program.

7.5 The comments are noted and it was certainly not intended to mislead. The statements referred to are general statements reflecting improvements in water quality in recent times which could lead to improvements in seagrass density and coverage.

Reference is made to future developments in the Harbour catchment which may impact adversely on water quality. With the current level of knowledge regarding water quality in Princess Royal Harbour it is reasonable to assume that new developments such as these will need to meet stringent environmental controls to prevent further environmental impact.

7.6 Figure 3.6 in the CER shows the most significant tidal flow affecting the study area is west to east rather than east to west. This means the study area is "downstream" from the major flow. Given this, the relatively small area of reclamation and the commitments given to reduce turbidity, impacts on the seagrass to the west are not expected

## 8 Dredging

8.1 The proposal as presented in the CER does not involve a dredging component. If a dredging proposal is presented in the future it should be subject to environmental impact assessment. The information contained in this review should be used to put that proposal in context and assess cumulative environmental impacts.

8.2 It is not envisaged that dredging will be required to maintain water depth adjacent to the new foreshore. Under Commitment 1.4.4 the proponent has undertaken to monitor the new foreshore alignment bi-annually for five years.

8.3 Figure 1.2 in the CER actually shows sediment accumulating on the eastern side of the Town Jetty and on the eastern side of the first groyne. Comparing this to the design of the current proposal it is obvious that the key area with potential for trapping sediments is the headland on the Western Precinct. Under commitment 1.4.1 the proponent has undertaken to design the headland to the satisfaction of the Department of Transport to prevent the movement of sand and deposition in the basin.

The key issue in this design will be to prevent water with sediments from swirling around the headland into the basin, losing velocity and dropping out the sediment load. Minimisation of disturbance during construction to prevent sediment mobilisation will also be a key issue.

## 9 Sewerage Management

9.1 The proponent is providing a second pumping station incorporating emergency overflow storage tanks.

9.2 The Water Authority is aware of the plans to connect the development to sewerage and it is they who requested emergency overflow storage. Commitment 1.5.7 binds the proponent to liaising with the Town of Albany to ensure an adequate sewage disposal system.

## 10 Recreation use

10.1 Full details of the proposed beach in the Western precinct are not known at this stage. Indications are that the beach will be adjacent to the Public Open Space area and be approximately 100 metres in length and 5 metres above the high tide mark.

10.2 The residential development adjacent to the western extremity of the development has since been redesigned. This is now the location of approximately 2000 square metres of open space with provision for 30 car bays. This will remove any conflict between the residential area and the beach.

## 11 Native Title Claim

11.1 Analysis of site history has been undertaken by Wolfe and Associates. The structure plan notes that:

*'Prior to the European settlement the local Aboriginal Mineng tribe hunted and lived on the shore of Princess Royal harbour. They most probably caught fish in the shallows and game in the surrounding bush. They may have also used the foreshore, with its protective sand dunes and nearby supplies of drinking water, as a tribal meeting place. Unfortunately no evidence has been found to confirm this activity.'*

While there is no direct link between the site and aboriginal habitation, aboriginal occupation has been included as a development theme for parts of the project. Initial indications are that native title is not applicable in this location.

## 12 Conflict of Development

12.1 The proposal development must be viewed as separate from the Port Authority development or any other application relating to Princess Royal Harbour. Impacts of the proposed Port development may be significant and of a completely different nature to the Albany Foreshore Development. The CER relates specifically to this area of Princess Royal Harbour, although impacts have been assessed in terms of the Harbour as a whole.

The entire region of Princess Royal Harbour has already been subject to a number of environmental studies, particularly in relation to seagrass and water quality, which have been referred to in the CER. While an integrated planning and environmental study may be applicable, it is difficult to do so without prior knowledge of proposed development applications.

## 13 Town Jetty

13.1 The Town Jetty has been identified as significant historical site in Albany. The jetty has been designated as a focal point for development and will refurbished to reflect its historical nature. There are no plans to replace the Jetty with a breakwater and if this was to occur in the future, would be subject of a separate environmental assessment.

## 14 Privatisation of the Foreshore

14.1 All foreshore areas within the proposed development are designated as public open space, allowing uninterrupted public access to all foreshore areas. These areas would developed as a series of cycleways and pedestrian paths for use by all residents of Albany, not just those in the development. One of the key objectives of the development is to link the town to Princess Royal Harbour, restricting foreshore access in any way would not serve this purpose.

# RESPONSE TO SUBMISSIONS

## *ATTACHMENT A: ADDITIONAL ISSUES*

### 1.0 RISK ASSESSMENT

The Department of Minerals and Energy (DOME) raised concerns in their letter dated 9 May 1995 about the risk assessment conducted for the CER. They have suggested that a minimum buffer of 25 metres between road carriageway and residential components of the development should be provided in order to reduce potential risk associated with traffic on Princess Royal Drive.

However, DOME's assessment and therefore their recommendation has been based on their reading of the assessment report (Bulletin 774, March 1995) for the Marlston Hill proposal in Bunbury. There are some significant differences between this proposal and the Albany Foreshore Redevelopment, specifically that it is not anticipated that any hazardous goods with the exception of LPG will be transported along Princess Royal Drive. The Marlston Hill development includes a proposal that the Bunbury Port Authority may handle in the future:

- 35,000 tonnes per year of methanol;
- 20,000 tonnes per year of ammonium nitrate; and
- 100 tonnes per year of explosives.

The Albany Port Authority does not propose to handle any hazardous goods to this extent. It is considered that the risk assessment conducted as part of the CER represents an adequate consideration of risk issues.

### 2.0 CONTAMINATED SITES

It is recognised that site investigations undertaken thus far do not give a clear indication of potential contamination on the development site. To prevent any delays in the EIA process, LandCorp will commit to further sampling and analysis to the satisfaction of the DEP. We understand that the key parameters to be investigated are:

- poly-cyclic aromatic hydrocarbons (PAH's);
- heavy metals;
- poly-chlorinated biphenyls (PCB's); and
- hydrocarbons.

Thus, the following commitments are made by LandCorp:

Commitment 1.2.1 The proponent will carry out further site assessment to determine the extent of any site contamination. The site assessment will be representative of the soils and groundwater of the total area with particular reference to areas with a high likelihood of contamination including the oil drum storage area and the old fuel depot. The sampling program will be carried out to the satisfaction of the DEP.

Commitment 1.2.2 The proponent will arrange analysis of the samples through a reputable analytical firm to include the following parameters:

- poly-cyclic aromatic hydrocarbons (PAH's);
- heavy metals;
- poly-chlorinated biphenyls (PCB's); and
- hydrocarbons.

The results will be submitted to the DEP.

Commitment 1.2.3 Any remedial action required as a result of the site investigations will be developed in consultation with the DEP and carried out to the satisfaction of the DEP.

## 3.0 PORT AUTHORITY CONCERNS

The Albany Port Authority is concerned about the impacts of surrounding developments on access routes, including LandCorp's foreshore redevelopment. Their concerns relate to three key issues, namely:

- access corridors and future port trade;
- buffer zones; and
- public health and safety.

The issue of maintaining the current port access corridor has been of key importance throughout the CER process.

Increasing traffic, both rail and road, as a result of the foreshore redevelopment and future port expansion has been addressed in the study. Traffic predictions were prepared by Sinclair Knight Merz in consultation with the Albany Port Authority and these have been used and will continue to be used in designing the road infrastructure for the foreshore redevelopment to ensure no unacceptable

conflict with existing and future port access. The development has been designed on the basis that Princess Royal Drive and the rail link will provide the only access to the port for the foreseeable future.

The Albany Port Authority is also concerned about maintaining buffer zones to the port. They are of the opinion that a suitable buffer will be provided to the foreshore redevelopment by boat facilities and the future town marina.

The Albany Port Authority is also concerned about future residential development on the port's northern boundary but this is outside the scope of the CER.

Public health and safety and risk is the final issue that the Albany Port Authority has raised. This is addressed in detail in Section 1.0 of this report for risk associated with transport past the foreshore redevelopment. The risk associated with the port itself is agreed by all parties to be within the guidelines established by the EPA.

The Albany Port Authority considers an underpass/overpass is required to link the development to York Street to alleviate safety concerns. The development provides a pedestrian overpass and traffic predictions indicate that a grade separated vehicular intersection will not be needed in the next 20 years which is the normal planning horizon. Recent investigations by Halpern Glick Maunsell indicate there are a number of options which could achieve this objective in the longer term.

## 4.0 NOISE ASSESSMENT

The following revised commitment is made in respect of noise:

Commitment 1.8.1 The proponent commits to recommending that the Town of Albany and the Ministry for Planning designate specifically in the Precinct Plans for the foreshore redevelopment the building design and construction guidelines required to acheive the following noise conditions for residential buildings facing onto Princess Royal Drive:

- an internal noise standard of 35 dB $L_{Aeq}$ over any fifteen minute period between 2200 hours and 0700 hours in bedrooms only for any road and rail traffic;
- 50 dB $L_{Amax}$ for noise from any rail activities between 2200 hours and 0700 hours.

The proponents are prepared to accept some or all of the following Development Conditions shall be used to acheive the above noise standards:

- bedrooms shall preferably be placed in the part of the house furthest away from the road;
- all walls shall be constructed of double brick;
- all roof materials shall be either clay or concrete tiles;
- all glazing shall be 10mm thick laminated;
- all external doors shall be of solid core construction with seals;
- all ceilings shall be insulated;
- all plasterboard celings shall be 19mm thick; and
- mechanical ventilation shall be installed.

# Appendix 4

## List of submitters

A. W. Newman
S. Britt
J. Cartmell
Conservation Council of WA Inc.
Town of Albany

Department of Transport
WA Tourism Commission
Albany Waterways management Authority
Main Roads Department
Water Authority of Western Australia
Fisheries Department
Westrail

# Appendix 5

## Proponents commitments

The following commitments are made to ensure that this proposal proceeds in an environmentally acceptable manner. Those commitments flagged by an asterisk (*) have been identified as requiring specific auditing by the EPA.

# COMMITMENTS

## 1.1 INTRODUCTION

The following commitments are made by LandCorp to ensure that the potential environmental impacts resulting from site development are minimised and managed. The relevant management measures, authorities responsible and timeframes for monitoring are identified in each section. Key issues which are addressed include:

contaminated sites;
impacts on seagrasses and marine fauna;
impacts on coastal processes;
impacts on water quality and circulation;
impacts on heritage and archaeology;
dust control;
noise control;
traffic management; and
impacts on recreation.

## 1.2 CONTAMINATED SITES

1.2.1 Prior to construction, the proponent shall advise, in writing, the Western Australian Heritage Council, the Western Australian Museum and local museums that contaminated soils are proposed to be removed. This will allow any heritage investigations to be conducted. Relevant organisations shall consult with the proponent to arrange monitoring or heritage investigations.

* 1.2.2 The proponent shall ensure that the contaminated soil in Areas 'A', 'B' and 'C' are removed and clean filled to the satisfaction of the Town of Albany.

1.2.3 The proponent commits to making the necessary contractual arrangements in order that the contractor ensures that construction workers at the site who may have potential prolonged or significant contact with subsurface soil and/or groundwater, wear necessary protective clothing in order to avoid dermal contact or ingestion of these media.

1.2.4 The proponent commits to carry out necessary measures in order to prevent the use of groundwater from the subject premises as a potable source of water until such time that the groundwater quality is reassessed

and found to be of an acceptable standard. This reassessment should be undertaken in consultation with and to the satisfaction of the DEP.

## 1.3 SEAGRASSES AND MARINE FAUNA

**Construction Phase**

1.3.1 The proponent shall use cohesionless granular fill material with a minimum silt, clay and organic fraction and little or no nutrients during the reclamation process.

* 1.3.2 The proponent shall attempt to confine filling operations to autumn, winter and spring months. Where this cannot be achieved sediment curtains will be used to minimise the impacts of turbidity on seagrass meadows.

* 1.3.3 The proponent will ensure placement of fill material is planned and carried out in a manner that causes any turbid water to be directed away from seagrass areas, to the satisfaction of AWMA. Discharge water which requires pumping from reclaimed areas will be directed to a settlement pond or another reclamation fill area to allow it to settle before flowing into the Harbour. This will minimise the impacts of turbidity on seagrasses.

* 1.3.4 The proponent will confine temporary filling for seawall construction to only that necessary to allow work to be completed. No disturbance will be allowed outside of this area.

1.3.5 The proponent will ensure that excavated sediments for seawalls, where they could contain organic matter, nutrients, or fine clay or silt fractions, are disposed of at the Hanrahan Road refuse tip or other suitable location. This shall be carried out to the satisfaction of the DEP and the Town of Albany.

1.3.6 The proponent will advise contracted construction companies that they should ensure containment and retention of all site contaminants, wastes and runoff.

1.3.7 The proponent will confirm with construction contractors and operators of construction vessels, for example pile drivers, of measures required to avoid fuel and oil spills. This shall be done in consultation with AWMA.

1.3.8 The measures required in Commitment 1.3.7 will be prepared by the proponent to the satisfaction of AWMA.

**Post-Construction Phase**

* 1.3.9 The proponent undertakes to monitor areas of seagrass affected to ensure it is not greater than predicted and record changes through annual mapping using aerial photographs and dive survey checking of selected transects annually for a period of five years after construction commences. This monitoring shall be carried out to the satisfaction of the DEP and results shall be reported to and discussed with AWMA on an annual basis.

## 1.4 COASTAL PROCESSES

**Construction Phase**

* 1.4.1 The proponent will ensure that the headland on Western Precinct is of sufficient size and appropriate design to minimise sand from moving in an easterly direction and depositing on the eastern side of this new breakwater. This shall be done to the satisfaction of the Department of Transport.

1.4.2 The proponent will ensure that predominantly washed beach sand with a particle size greater than 0.2 millimetres in diameter (medium to coarse sand) is used to construct the beach on the Western Precinct.

* 1.4.3 The proponent will liaise with the Town of Albany to ensure that the proposed drainage outlet to the west of the town jetty breakwater is relocated to the eastern side to maximise sediment disposal dispersal and to minimise sediment build up in the embayment area.

**Post-Construction Phase**

* 1.4.4 The proponent will monitor sand build-up beyond the predicted shoreline location which results from the construction of the artificial embayment heads by undertaking an assessment using aerial photographs and monitoring in two locations, the Western Precinct and the Accommodation Precinct, shown on *Figure 5.1* in the CER, on a bi-annual basis for a period of five years. This shall be carried out to the satisfaction of the DEP and an annual report of monitoring results and

activities will be provided to the DEP and any remedial actions undertaken.

## 1.5 WATER QUALITY AND CIRCULATION

* 1.5.1 The project will not involve dredging. Should dredging be contemplated at a later stage it would be subject to separate environmental impact assessment and would be referred by the proponent to DEP.

**Pre-Construction Phase**

* 1.5.2 The proponent will ensure that a program for the placement of fill into reclamation areas is developed in consultation with AWMA in order to minimise turbidity and potential for sedimentation.

* 1.5.3 The proponent will ensure that sediment curtains are used during construction, to the satisfaction of AWMA, to minimise the impact of sedimentation and turbidity and potential for sedimentation.

**Construction Phase**

* 1.5.4 The proponent will liaise with the Town of Albany to ensure that baffles are built at all drainage outlet points to act as velocity attenuators and traps in the case of an upgradient fuel spill. The design of the baffle system will be discussed informally by the construction engineers and the Town of Albany and implemented to the satisfaction of the Town of Albany.

1.5.5 The proponent will ensure that sediment traps and litter traps, as identified in *Figure 5.1, Figure 5.2* and *Figure 5.3* in the CER, are constructed as part of the Town Square Precinct. This will be done to the satisfaction of the Town of Albany to ensure that adequate access is provided for maintenance purposes.

* 1.5.6 The proponent shall ensure that the fill process is designed to maximise settlement before the water flows into the harbour. This will be specified in the construction program identified in Commitment 1.5.1.

1.5.7 The proponent shall liaise with the Town of Albany to ensure that adequate sewerage systems are put in place such that no sewage or waste emanating from the site enters Princess Royal harbour.

**Post-Construction Phase**

* 1.5.8 The proponent will liaise with the Town of Albany to ensure that a minimum amount of stormwater containing sediments is released directly into the harbour. This will be achieved through the use of baffles, litter traps and sedimentation pits located beneath the main drains in the Town Square Precinct and at the drainage outlet currently located near the town jetty. Plans for these facilities would be developed to the satisfaction of the Town of Albany.

1.5.9 The Town of Albany shall ensure that bird feeding activities are controlled to prevent pollution of the water as a result of decomposing food or from excessive levels of bird excreta. This will be achieved by providing appropriate signage and regular cleaning and maintenance by the Town of Albany.

1.5.10 The proponent shall liaise with the Town of Albany to ensure that an appropriate fertiliser regime is applied to all parks and gardens to minimise any input of nutrients to the waterway. A policy for this regime should be developed by the Town of Albany in conjunction with AWMA.

1.5.11 The proponent will liaise with the Town of Albany to identify an appropriate cleaning and maintenance schedule for the sediment and litter traps identified in Commitment 1.5.5 and ensure that this is conducted on a regular basis.

* 1.5.12 The proponent will liaise with the Town of Albany to establish a monitoring program of the water quality of the embayment through quarterly visual assessments and water sampling for a period of three years with biannual reports to AWMA and the DEP, reporting activities and results.

* 1.5.13 The proponent will liaise with the Town of Albany to establish a monitoring program for all drain outlets. Quarterly sampling within the project area shall be undertaken to ensure contaminants are not entering the marine environment. Bi-annual reports of results would be provided to AWMA and the DEP.

## 1.6 HERITAGE AND ARCHAEOLOGY

**Construction Phase**

1.6.1 In the event of the discovery of artefact material or a specific historical archaeological site, the proponent will take the following steps:

- work will stop temporarily;

- a photograph using a visible scale and a brief written description of the artefacts or site will be prepared;

- the significance of the site will be determined on the basis of available data;

- on the basis of the significance assessment the following will be done; continue work, continue work but avoid disturbance by work around the site if possible and arrange for further inspection, recording and, if necessary, professional assistance; and

- the location of the site will be plotted on plans for further reference and to minimise further disturbance.

1.6.2 The proponent shall ensure that these guidelines are provided to contracted construction firms.

If continued disturbance of a site is necessary the proponent will undertake to:

- have a qualified historical archaeologist assess the site and, if necessary, undertake a watching brief during the disturbance phase;

- record the details of the site and take a sample of artefacts for dating, educational and other purposes;

- arrange the analysis, conservation and storage of artefacts; and

- report the findings of the watching brief and artefact analysis to LandCorp or other designated authority.

1.6.3 With regard to large individual artefacts, such as industrial machinery, the proponent will ensure that:

- an assessment is made of the significance of the item using appropriate specialist advice if required;

- the artefact is removed if this is determined to be appropriate;

- the artefact is stabilised and conserved; and

- arrangements are made for the storage and ongoing management of the artefact.

**Post-Construction Phase**

1.6.4 The proponent will undertake to:

- have historical/archaeological guidelines drawn up for future foreshore developers;
- ensure that large artefacts which are recovered are suitably conserved and integrated into the design of public areas; and
- have interpretative plaques mounted at suitable locations which explain the site's significant and history.

1.6.5 The proponent will ensure that Commitments 1.6.1-1.6.4 are carried out to the satisfaction of the WA Museum and Heritage Council of WA.

## 1.7 DUST CONTROL

**Construction Phase**

* 1.7.1 The proponent shall control dust, including wind blown particulate matter, to the extent necessary to ensure that there are no substantiated complaints of dust nuisance.

* 1.7.2 Prior to the commencement of any ground disturbing activities, the proponent shall prepare a Dust Management Strategy to achieve the objective of Commitment 1.7.1.

* 1.7.3 The proponent shall implement the Dust Management Strategy required by Commitment 1.7.2 to the satisfaction of the EPA Dust Control Guidelines and the Town of Albany.

## 1.8 NOISE CONTROL

**Pre-Construction Phase**

* 1.8.1 The proponent commits to recommending that the Town of Albany and the Ministry for Planning designate specifically in the Precinct Plans for the foreshore redevelopment the building design and construction guidelines required to achieve the following noise conditions:

- an internal noise standard of 35 dB $L_{Aeq}$ over any fifteen minute period between 2200 hours and 0700 hours in bedrooms only for any road and rail traffic;

- 50 dB $L_{Amax}$ for noise from any rail activities between 2200 hours and 0700 hours.

The proponents are prepared to accept that some or all of the following Development Conditions shall be used to achieve the above noise standards:

- bedrooms shall preferably be placed in the part of the house furthest away from the road;

- all walls shall be constructed of double brick;

- all roof materials shall be either clay or concrete tiles;

- all glazing shall be 10mm thick laminated;

- all external doors shall be of solid core construction with seals;

- all ceilings shall be insulated;

- all plasterboard ceilings shall be 19mm thick; and

- mechanical ventilation shall be installed.

1.8.2 The proponent shall prepare these building conditions to the satisfaction of the DEP.

## 1.9 TRAFFIC MANAGEMENT

**Construction Phase**

1.9.1 The proponent shall undertake to manage traffic activity associated with site construction to the extent necessary to meet the requirements of the EPA to ensure that noise levels are not exceeded.

1.9.2 The proponent undertakes to respond to and alleviate traffic congestion problems which may occur as a result of construction activity.

## 1.10 RECREATION

### Construction Phase

1.10.1 The proponent, together with the Town of Albany, should ensure that as far as possible access to the town jetty and other recreational facilities in the project area is maintained during the construction phase through the provision of alternative access roads if necessary.

### Post-Construction Phase

1.10.2 The proponent, together with the Town of Albany, will ensure that the development of the site does not inhibit, but rather maximises, public use of the project area through bike and pedestrian paths, promenades and beaches.