

Bunbury Harbour City Development

**South West Development Authority & Department of Marine and
Harbours**

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

**Environmental Protection Authority
Perth, Western Australia
Bulletin 660
November 1992**

THE PURPOSE OF THIS REPORT

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

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

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

APPEALS

If you disagree with any of the 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 11 December 1992.

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Summary and recommendations

This proposal, which consists of a marina development and a rezoning proposal for land based development was referred to the Environmental Protection Authority in May 1990 after a period of negotiation and discussion between various state and local government agencies involved with the Bunbury Harbour City Concept and the City of Bunbury Town Planning Scheme No 6 Amendment No 82. The Amendment No 82 has since been withdrawn from the environmental assessment process.

The first draft of the proponent's Public Environmental Review documentation was received in June 1992 and was released for public comment July 1992.

The marina development includes construction of a causeway between the Outer Harbour and Casuarina Harbour, land reclamation to construct a new beach and to provide additional area for development, groynes, marina car-parking, construction of a boat launching ramp and development of more than 70 additional pens. Sand for the land reclamation is proposed to come from local sand pits and sand trapped at the groyne on the western side of Point Casuarina.

The rezoning proposes to change an area which is currently predominantly industrial (fuel storage, engineering workshops and warehouses) and includes the main access road to the Outer Harbour to land uses such as tourist, hotel, retail, office and residential. Approval to advertise the rezoning proposal in accordance with planning requirements has not yet been sought by the proponent.

For the purpose of making recommendations regarding this proposal the Environmental Protection Authority has considered the proposal in two parts, namely the marina development and proposed rezoning. In assessing the marina development the Environmental Protection Authority has considered only the marina development itself and not the acceptability of land uses proposed for the reclaimed land. The land reclamation is considered to be part of the marina development.

Marina development

The Authority considers that the proponent's commitments have adequately addressed most of the environmental issues associated with the marina development. Issues addressed by commitments include management of water quality (with the exception of sullage management), Greenhouse gas effects, on-going management of the marina, oil spill contingency, public access and most construction impacts including protecting the resident dolphins, dust and noise. The proposed removal of sand from Point Casuarina Beach had not been adequately considered.

Recommendation 1

The Environmental Protection Authority has concluded that the proposed marina development at Bunbury Harbour, as modified during the process of interaction between the proponent, the Environmental Protection Authority, the public and Government agencies is environmentally acceptable.

In reaching this conclusion the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as;

- **management and design to ensure acceptable marina water quality;**
- **design to minimise effects of climate and sea level changes possible from the Greenhouse effect;**

- construction impacts; and
- protection of resident dolphins.

The Environmental Protection Authority considers that these environmental factors have been addressed adequately by either environmental commitments by the proponent or by the Environmental Protection Authority recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the marina development could proceed subject to the Environmental Protection Authority recommendations in this report and the proponents environmental commitments (Appendix 1).

The proposal envisages using sand from local sand pits, material dredged from the ocean floor and sand removed from Point Casuarina beach for land reclamation. The Environmental Protection Authority is concerned that there is insufficient information on the consequences of removing beach sand and that this should not occur until further study is done. This would not apply to the other two sources of material.

The Authority sought advice from the Coastal Branch of the Department of Planning and Urban Development on the likely impacts of removing the sand from Point Casuarina beach for land reclamation purposes and formulated recommendation 2 based on that advice.

Recommendation 2

The Environmental Protection Authority recommends that prior to any excavation of beach sand for the marina development the Department of Marine and Harbours should determine;

- the coastal stability of Point Casuarina beach (ie where the sand is to be removed from);
- the implications of sand excavation on adjacent beaches to the south and to the north; and
- the approximate amount of sand which may be taken from the beach (in cubic metres) from Point Casuarina Beach without adversely affecting the amenity of this and other beaches in the area,

to meet the requirements of the Environmental Protection Authority on advice of the Department of Planning and Urban Development.

To prevent nutrient enrichment and bacterial contamination of the marina waterbody it is essential that no sewage or sullage wastes enter the marina. The proponent does not intend to install sullage pump out facilities until 100 pens are constructed and leased, however has not indicated how boats with sullage tanks will be able to dispose of their wastes at the Marina.

Recommendation 3

The Environmental Protection Authority recommends that prior to the Department of Marine and Harbours leasing any mooring or pens within the marina development, the Department make arrangements to provide for sullage tank effluent disposal at the marina development, to the requirements of the Environmental Protection Authority.

Rezoning

In relation to the proposed rezoning from an area currently predominantly zoned for Industrial uses to Special Use (Bunbury Harbour City) the Environmental Protection Authority does not consider that sufficient information on a number of important environmental issues is available to enable it to finalise this part of the assessment. There is both insufficient information and sufficient uncertainty in the information provided to assess the environmental acceptability of the proposed rezoning from an area currently predominantly zoned for Industrial uses to Special Use (Bunbury Harbour City). Several of the key environmental issues associated with the proposed rezoning may take some time to resolve.

Issues of concern with regard to the rezoning include;

- noise-sensitive premises and land uses should not be located in areas affected by noise levels in excess of those noted in Appendix 3 from existing truck traffic to the Outer Harbour;
- the noise management measures proposed would not be able to reduce noise levels to levels currently acceptable or likely to be acceptable to the Authority at noise-sensitive premises;
- the recommendations of the Mineral Sands Task Force could significantly affect issues associated with traffic noise;
- hazard analysis work with regard to the continued use of the Outer Harbour for hazardous materials should also give consideration to relocating those activities to the Inner Harbour so that a comparison can be made on the risks associated with siting the hazards adjacent to (with hazardous materials being transported through) what is intended to be a popular tourist area, to siting the hazards in the Inner Harbour;
- prior to rezoning being finalised each existing lot should be assessed, managed and cleaned-up for the proposed land use proposed in the revised structure plan in accordance with the joint Australian and New Zealand Environment and Conservation Council/ National Health and Medical Research Council guidelines for the assessment and management of contaminated sites;
- the likelihood of the waste water treatment plant being re-located should be more certain before rezoning is approved; and
- the drainage system should maximise on-site retention of stormwater and that drainage should not be discharged direct through pipes into the marina or the ocean. (As a minimum, a one-in-ten year storm event should be retained on site).

Recommendation 4

The Environmental Protection Authority considers that before it assesses the environmental acceptability of the proposed rezoning from an area currently predominantly zoned for Industrial uses to Special Use (Bunbury Harbour City) the proponent needs to consider in more detail;

- **the location of noise-sensitive land uses in areas which may (depending on the outcome of the Mineral Sands Task Force) be affected by high noise levels from trucks servicing the Outer Harbour;**
- **hazard analysis, particularly with respect to assessment of alternative sites for the importation of hazardous materials, such as ammonium nitrate;**
- **potential site contamination on each existing lot from historical and current operations such as existing fuel storage tanks and engineering works;**

- relocation of the existing waste water treatment plant so that odours do not preclude development; and
- stormwater drainage design criteria.

The Environmental Protection Authority recommends that the rezoning not proceed at this time and recommends the Minister for the Environment seeks re-assessment pursuant to Section 43 of the Environmental Protection Act after the proponent has adequately addressed the above matters.

On the basis of the above recommendation, the Authority believes that it would be appropriate for the Minister to issue a statement giving conditional approval to the marina and withholding completion of approval for the rezoning at this time until these issues are resolved.

The Environmental Protection Authority recognises that it may be some time before issues noted above are resolved, such as whether or not operations such as mineral sands loading and importation of ammonium nitrate at the Outer Harbour are to be re-located. These issues significantly affect the environmental acceptability of the proposal.

The Environmental Protection Authority suggests that if the proponent wishes to pursue the vision of changing the land use in the area covered by this proposal to residential and tourist uses, the issues of concern to the Authority could be addressed through a publicly available structure plan in parallel with environmental documentation.

Implementing the above suggestion and recommendation would explicitly link the environmental and planning approval procedures, so that a more rapid decision making process could result when issues are resolved.

Issues of concern to the public and other authorities such as coastal setback, traffic management and heritage conservation would be resolved at the same time by using a linked environmental/planning process.

1 Introduction and background

This proposal to construct a marina and rezone an area west of The Plug was referred to the Environmental Protection Authority in May 1990 after a period of negotiation and discussions between various state and local government agencies involved with the Bunbury Harbour City Concept and Town Planning Scheme No 6 Amendment No 82.

The Bunbury Harbour City Concept was released for public review in December 1988. The portion of the Bunbury Harbour City Concept subject to this proposal is shown in Figure 1.

Town Planning Scheme No 6 Amendment No 82 covered the part of the Bunbury Harbour City Concept west of The Plug and proposed a general industry zone where residential and tourist development was proposed by the Bunbury Harbour City Concept. Amendment 82 was to be formally assessed as a Consultative Environmental Review by the Authority.

In response to negotiations and discussions regarding the Bunbury Harbour City Concept the City of Bunbury resolved not to proceed with Amendment No 82 in April 1990 and initiated Amendment No 129 in August 1991 which related to a portion of Bunbury Harbour City east of The Plug. Amendment No 129 was assessed informally by the Authority.

When the level of assessment for this proposal was set as Public Environmental Review in May 1990 one appeal requesting a reduced level of assessment was received by the Minister for the Environment. The Minister dismissed the appeal.

1.1 Planning status

Officers of the City of Bunbury have indicated that, following environmental assessment of the Bunbury Harbour City Development, a new rezoning amendment consistent with the Public Environmental Review and Environmental Conditions may be initiated. A new rezoning amendment is considered preferable to completely revising Town Planning Scheme Amendment No 82 because of the extent of changes that would be required.

1.2 Nature of this assessment

The Environmental Protection Authority has considered this proposal as two related but separate parts. The first is the marina development, which has issues principally associated with water quality. The second, and more complex part, deals with the redevelopment of the land. As a consequence the assessment of these two parts has been undertaken somewhat separately in this report.

2 Description of proposal

The proposal envisages changing the area adjacent to the centre of Bunbury from an industrial area to a residential and tourist area which complements the town.

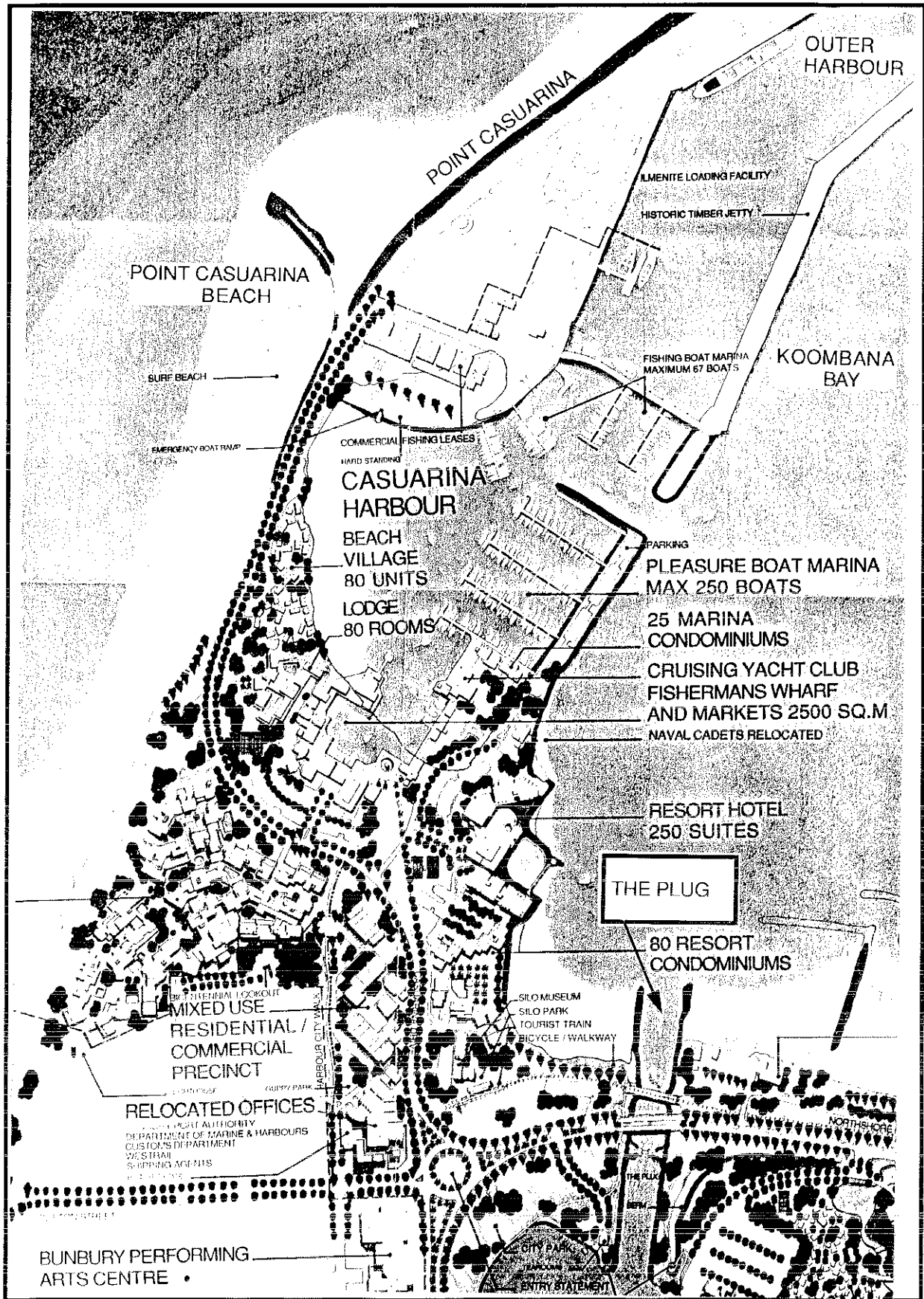


Figure 1: Bunbury Harbour City Concept, 1988/89. Please note that this Report does not assess the proposal shown in this figure. Note also the location of the plug and the groyne on the western side of Point Casuarina.

The proposal has two parts as outlined below.

2.1 Marina development

The marina development is proposed to occur in three stages (see Figure 2) as follows;

Stage 1 - Launching ramp and seventy serviced pens;

Stage 2 - Groynes, marina car parking and additional pens; and

Stage 3 - Land reclamation, commercial leasehold lots and new beach.

For the purposes of making recommendations regarding this part of the Bunbury Harbour City Development proposal the Environmental Protection Authority has not considered the acceptability of land uses proposed for the reclaimed land, such as the festival retail lots, beach village, hotel and condominiums. The acceptability of such land uses is considered in the Authority's recommendations relating to the rezoning part of the proposal and cannot occur under the current City of Bunbury Town Planning Scheme unless the scheme is amended.

However, the three industrial lease lots are considered as part of the marina complex and are a permitted land use under the current City of Bunbury Town Planning Scheme.

2.2 Rezoning

It is proposed that the area shown in Figure 3 be rezoned from the current uses to "Special Use (Bunbury Harbour City)" zone. As noted above, no amendment has been initiated to the City of Bunbury Town Planning Scheme at this stage, however this may occur following this report and recommendations.

The specific land use items proposed within the Special Use (Bunbury Harbour City) zone are listed below;

- Boat Harbour
- Cruising yacht club
- Fisher's wharf and market
- Residential
- Power boat club
- Museum
- Professional offices
- Fishing industry facility
- Harbour beach village
- Resort hotel
- Historic precinct
- Sailing club
- Retail
- Pleasure boat marina
- Harbourside lodge
- Holiday apartments
- Tourist railway
- Parks and recreation
- Markets

The Public Environmental Review included a structure plan dated July 1990, however the proponent has advised the Authority that this plan is indicative only and should not be used as a basis for assessing the acceptability of land uses at particular locations within the proposed Special Use (Bunbury Harbour City) zone.

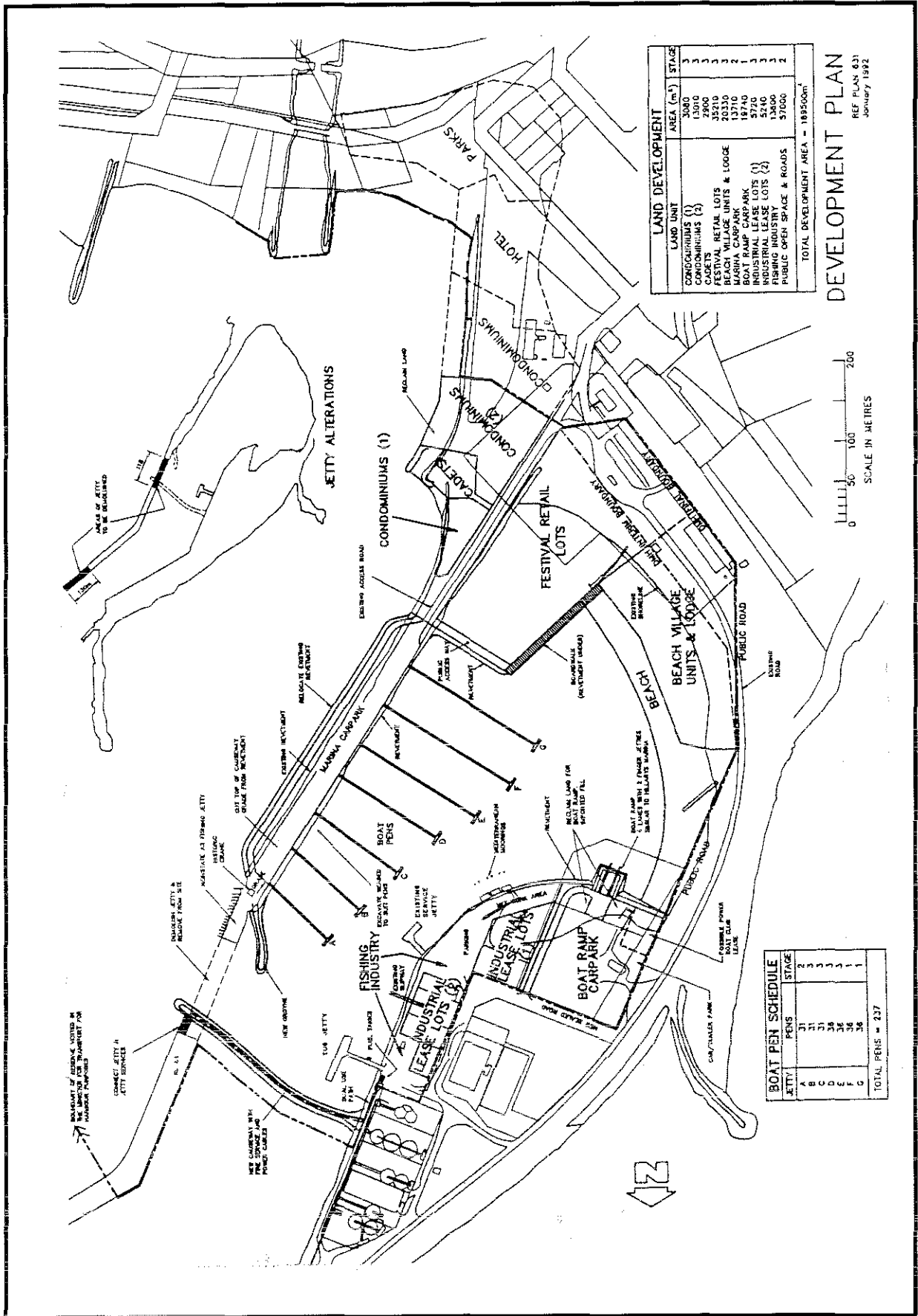


Figure 2: Proposed marina complex. Please note land uses shown are not considered in the assessment of the marina development.

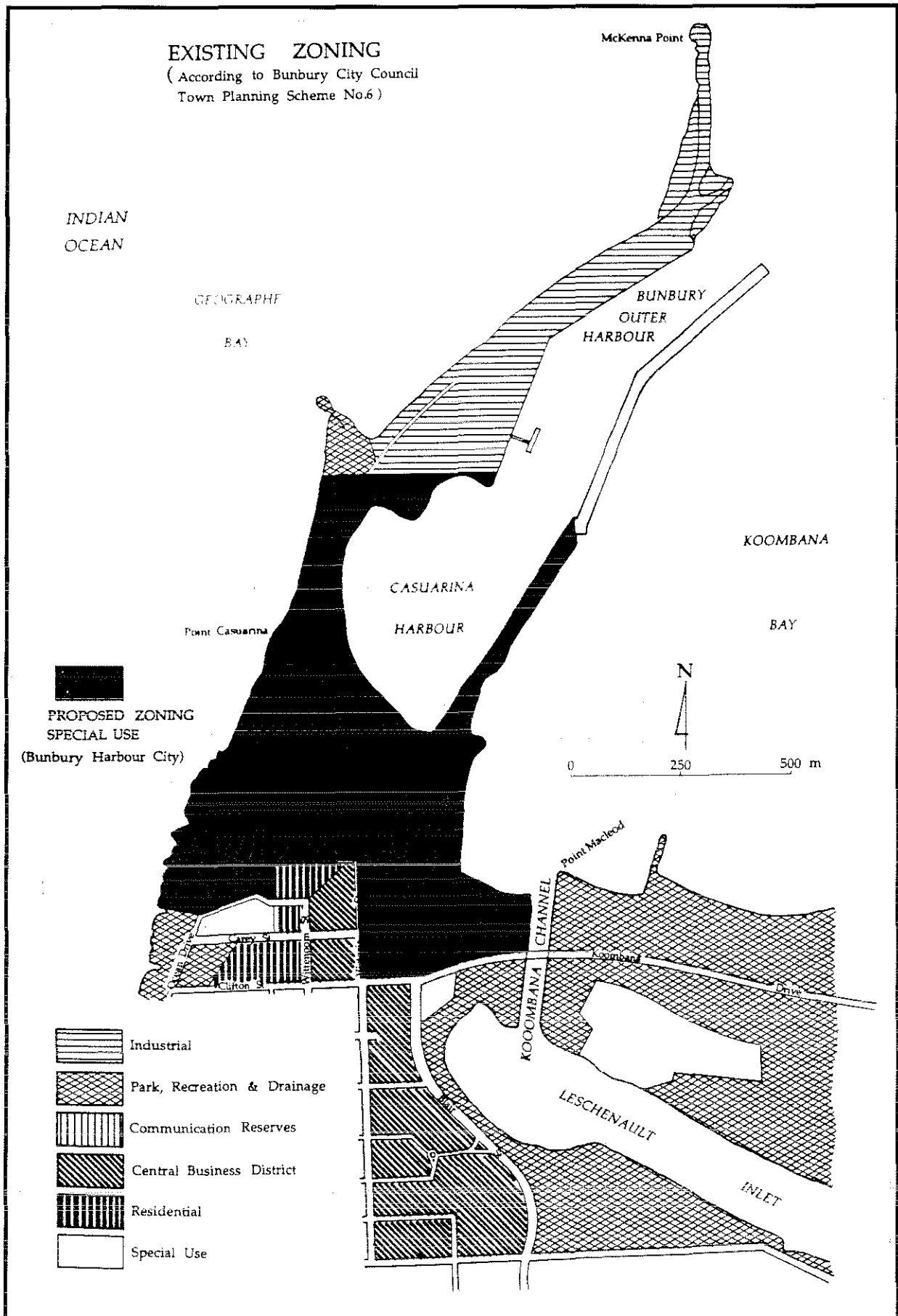


Figure 3: Proposed Special Use (Bunbury Harbour City) zone.

2.3 Proponents commitments

In the Public Environmental Review document the proponent made a number of commitments which describe how environmental impacts will be managed or minimised.

In response to comments from the Authority following the public submission period the proponent rationalised the commitments provided in the Public Environmental Review. The rationalisation has consisted of splitting the commitments into Environmental Commitments to be audited as part of Environmental Conditions if the proposal proceeds and Other Commitments which explain how the project is to be implemented or note compliance with other legislation and regulations. The proponent has amalgamated or reworded several of the Environmental Commitments to ensure that they are able to be audited. Appendix One contains the Environmental Commitments, the other commitments and a summary of changes made to the commitments since the Public Environmental Review.

3 Existing and adjacent land use

Existing land use in the area affected by the rezoning is predominantly fuel storage tanks, heavy machinery workshops and warehouse/storage facilities. A historic hotel, some historic grain silos and a tourist lookout are also located within the area proposed to be rezoned.

To the north of the proposed rezoning lies the Outer Harbour. Although the Outer Harbour is primarily used by mineral sands companies other goods are loaded or unloaded at the Outer Harbour. Hazardous goods unloaded in the past have included methanol and ammonium nitrate.

The Department of Marine and Harbours assessed the condition of the Outer Harbour wharf in September 1992 and noted that it is in good condition and could last many decades, at least to and beyond 2010. Mineral sands companies consider that their investments in Outer Harbour infrastructure would last several decades.

Trucks carrying mineral sands or other goods must travel through the area proposed to be rezoned from Koombana Drive to reach the Outer Harbour. Further details regarding traffic to and from Outer Harbour appear in the relevant sections below.

To the south of the proposed rezoning existing uses include a tourist hotel, shops and other typical central business district premises, residential and parks and recreation.

4 Public submissions

The Public Environmental Review document prepared for this proposal was available for an eight week public submission period which closed on 2 October 1992. Particular expert advice on some aspects of the proposal was sought after the close of the public submission period and the relevant agencies from which advice was sought were requested to respond by 30 October 1992.

A total of 14 public submissions were received, nine of which were from State or local government.

The submissions raised a number of issues relating mainly to incompatibility between land uses proposed in the rezoning and continued use of the Outer Harbour. A summary of submissions and the proponents response to those submissions appears in Appendix 2.

5 Environmental assessment - Marina Development

The Environmental Protection Authority considers that most potential environmental impacts associated with the marina development are adequately addressed by the proponents amended Environmental Commitments (See Appendix 1). As noted above, several of the original commitments were amended to address concerns expressed by the Authority. The Environmental Commitments are referred to in the text by using the same numbering system as appears in Appendix 1 and the Public Environmental Review.

5.1 Construction impacts

5.1.1 Marine water quality

Both Stage 1 and Stage 3 of the proposal involve filling Koombana Bay. Filling operations have the potential to cause a plume of turbid water which looks unsightly, inhibits light penetration and adversely affect some benthic fauna and fish. Environmental Commitments 4 DMH and 5 DMH are associated with this issue and these have been amended to specify the site from which beach sand would be taken and specify that turbidity will be controlled to the satisfaction of the Environmental Protection Authority respectively. Clean fill from local sand pits and beach sand trapped on the southern side of the groyne on the western side of Point Casuarina (4 DMH) is proposed to be used. Turbidity is proposed to be minimised by constructing bunds and then filling behind the bund, so that turbid waters are largely confined to within bunded areas.

Stage 2 of the proposal includes dredging of 8 000 m³ of sand from inside the marina to provide fill for the project. The proponent has decided that in order to limit turbidity sea bed excavations would be limited to no more than one continuous week with daily hours of operation not exceeding ten hours (3 DMH). The objective of this commitment is to ensure sensitive habitats such as seagrass are not shaded for excessively long periods and so fish can enter these areas when waters are clear. The Authority understands there is no seagrass growing within the area to be dredged.

Construction wastes will not be allowed to enter the water (9 DMH) and this commitment has now been made to the satisfaction of the City of Bunbury. Construction wastes can be unsightly if they are floating around and can be a hazard to boats.

Some dewatering operations may need to be carried out to install services such as sewerage. Groundwater extracted from the site may be contaminated with hydrocarbons and organic contaminants from the fuel storage facilities or grain silos. The proponent has made a commitment to monitor and manage dewatering discharges to ensure discharges meet water quality criteria specified by the Environmental Protection Authority for the maintenance of aquatic ecosystems (7 DMH). Commitment 7 DMH has now been amended to incorporate 6 (DMH) and be to the satisfaction of the Environmental Protection Authority.

The proponent has also made a commitment to use portable toilets for works staff during the construction phase (10 DMH). The Authority understands that toilets waste will be removed off-site and therefore ensure ground and marine waters are not contaminated by nutrients and bacteria.

The Authority is satisfied that if the above commitments are implemented, marine water quality should not deteriorate unacceptably.

5.1.2 Removal of sand from the groyne on Casuarina Point

The Authority sought advice from the Coastal Branch of the Department of Planning and Urban Development on the likely impacts of removing the beach sand trapped by the groyne on the western side of Point Casuarina for land reclamation purposes and was advised that;

- the Department does not support sand excavation from a beach in principle, as it causes erosion of the coastline;
- beaches to the south of the groyne (Eg Hungry Hollow) are eroding and remedial measures which would reduce the sand supply to the groyne at Casuarina Point are proposed; and
- that after consideration of the known factors contributing to coastal stability along the Bunbury coastline, the Department concludes that some sand could be used from near the groyne, but that the main source of sand should be local sand pits.

The Department of Planning and Urban Development considered that, prior to approval for beach excavation being granted, the Department of Marine and Harbours should determine;

- the coastal stability of Point Casuarina beach (ie where the sand is to be removed from);
- the implications of sand excavation on adjacent beaches to the south and to the north; and
- the approximate amount of sand which may be taken from the beach (in cubic metres) from Point Casuarina Beach without adversely affecting the amenity of this and other beaches in the area,

The Environmental Protection Authority concurs with this approach and has recommended accordingly.

5.1.3 Dolphins

The Bunbury Dolphin Trust classifies dolphins as resident in Koombana Bay because there appear to be 20 to 30 dolphins which visit the bay and are seen at least three times per week. However, this does vary from time to time due to changes in weather and feeding conditions.

The proponent has made a commitment to consult with the Department of Conservation and Land Management and the Western Australian Department of Fisheries to determine timing of blasting (14 DMH) and has now changed commitment 13 DMH so that blasting is carried out in accordance with Australian Standards and to the satisfaction of the Mines Department and the Environmental Protection Authority. The proponents response to submissions states that consultation with the Bunbury Dolphin Trust will also occur to determine appropriate times to carry out blasting. The Trust is currently studying the dolphins.

5.1.4 Noise and dust

Construction noise would come from several sources, but mostly from machinery and blasting operations. The proponent has made a commitment to comply with Environmental Protection Authority noise recommendations and regulations (23 DMH) and to undertake blasting in accordance with Australian Standards to the satisfaction of the Mines Department and the Environmental Protection Authority (13 DMH). The Environmental Protection Authority noise recommendations appear in Appendix 3 of this report. As noted above, commitment 13 DMH was amended in response to concerns expressed by the Authority.

The proponent has made a commitment to control dust in accordance with Environmental Protection Authority Dust Control Guidelines (15 DMH) and to cover all trucks transporting sand and soil to the site to the satisfaction of the City of Bunbury (16 DMH).

5.1.5 Protection of historical features

Appendix 4 to the Public Environmental Review was a report on the European History associated with the area affected by the marina and rezoning proposal. The proponents response to public submissions states that the proponent is committed to preserving the historic/heritage values of the area and that consultation with the Heritage Council of WA will be undertaken

when considering redevelopment of any historic sites in the area. The proponent has also provided a commitment to give the Bunbury Historical Society seven days notice prior to removal of designated sections of the Bunbury Jetty (28 DMH).

5.2 Greenhouse Effect

The Environmental Protection Authority considers that for this proposal it is appropriate to consider the potential effects of sea level changes and climate change which may result from increased levels of greenhouse gasses in the atmosphere.

Fill levels have been specified so that the predicted impact of the Greenhouse Effect will not adversely affect the proposal (1 DMH). The Authority has been advised that other structures, such as the new causeway separating Outer Harbour from the marina, have been designed with regard for climate and sea level changes which may result from continued discharge of Greenhouse gasses. The Environmental Protection Authority concurs with the approach taken by the proponent on this issue.

5.3 Marina design to protect water quality

5.3.1 Sewerage and sullage pump out

All facilities associated with the marina development would need to be sewered to prevent nutrient enrichment and bacterial contamination of the marina waterbody and groundwater table. Likewise, an overflow of sewerage into the marina could adversely affect water quality. Commitment 32 DMH to connect to sewer and prepare contingency plans in case of system failure adequately addresses these concerns.

The proponents response to public submissions states that a sewage pumpout facility will be constructed when 100 pens have been constructed and leased, or when legislation enforcing the installation and use of boat sullage tanks is anticipated. However the proponent did not explain how boats with sullage tanks would be able to dispose of sullage wastes in the interim. The Authority considers dumping of sullage wastes within the marina unacceptable and considers that if sullage pump out facilities are not to be provided, alternative means be provided to enable marina users to dispose of sullage wastes. The Environmental Protection Authority has recommended accordingly.

5.3.2 Drainage

Stormwater often carries nutrients from recently applied fertiliser and other sources, hydrocarbons such as oil and grease which leak from cars, and heavy metals such as lead from petrol. Direct discharge of stormwater into a marina can adversely affect water quality. The proponent has made a commitment to contain stormwater on site as a policy and to design the stormwater drainage system to the satisfaction of the Environmental Protection Authority (29 DMH).

5.3.3 Flushing characteristics and potential pollutant inputs

The Marine Branch of the Environmental Protection Authority has assessed the flushing calculations for the proposed marina which were provided in Appendix 5, Section 4 of the Public Environmental Review and consider that they are accurate. The marina has a tidally induced flushing time of 6 days although flushing time ranges from one to 18 days for the best to worst meteorological/ oceanographic conditions. Provided the proposal is implemented in accordance with commitments 1 SWDA, 7-10 and 29-35 DMH, and that no sullage effluent is disposed of into the marina, inputs of contaminants which could adversely affect water quality should be minimal and water quality is likely to remain satisfactory for the beneficial uses

associated with marina developments. The proponent has specified the beneficial use as the "maintenance and preservation of aquatic ecosystems".

5.4 On-going marina management

The Department of Marine and Harbours as the proponent for this marina will be responsible for on-going marina management.

5.5 Water quality management and monitoring

5.5.1 Marine Management Programme

The proponents commitment to preparation and implementation of a Marine Management Programme (See Appendix 1) and the proponents commitment to maintain effective water exchange to maintain water quality within the marina to a standard suitable for the maintenance and preservation of aquatic ecosystems (41 DMH) should ensure water quality is managed to that it remains satisfactory within the marina.

The proposed Marine Management Programme states that "the (monitoring) data obtained may lead to alterations in the strategies employed in the management of design of the marina complex". This indicates that action will be taken if water quality in the marina consistently falls below the specified water quality standards.

5.5.2 Oil spills and other accidental pollution

The level of boating activity likely within and around the marina make it essential that an oil spill contingency plan and a plan to address other accidents which could cause pollution is prepared. The proponent has made a commitment to prepare and trial a contingency plan immediately following construction of Stage 1 of the Marina (35 DMH).

5.5.3 Tributyl tin and other anti-foulants

As regulations prohibiting the use of tributyl tin on boats more than 25m in length were gazetted in 1991 the proponents commitment with regard to this issue (33 DMH) duplicates the existing regulations.

Monitoring and management of tributyl tin and other anti-foulants should be adequately addressed through implementation of the Marine Management Programme noted above.

5.6 Other issues

5.5.1 Industrial risk

The Environmental Protection Authority considers that, with the exception of periods when ammonium nitrate is being imported, the marina development is outside the area where risks and hazards are of concern.

The proponent has made a commitment to prohibit public access to and use of the marina complex whilst transportation and loading of ammonium nitrate is occurring, to the satisfaction of the Department of Mines (now the Department of Minerals and Energy) (38 DMH). This is satisfactory to the Authority.

5.5.2 Discharges or emissions from industrial lease lots

Discharges from the industrial lease lots into the marina should not be permitted unless the proponent can demonstrate that water quality in the marina will not be adversely affected. Similarly emissions which could affect the amenity of the area should not be permitted. The requirements for works approval and licensing of discharges and emissions from prescribed premises under the Environmental Protection Act should ensure unacceptable discharges do not occur. However, the Department of Marine and Harbours may wish to consider including appropriate clauses on lease documents to indicate to potential lessees that emissions and discharges may be restricted.

5.5.3 Dust

The Authority understands that dust from trucks going to the Outer Harbour is no longer a problem because all trucks have covers over their load, particularly when travelling on Bunbury Port Authority land.

Dust from loading operations at the Outer Harbour has been a problem. However several mineral sands companies indicated in their submissions to the Public Environmental Review that they were committed to eliminate dust problems during ship loading. The Department of Marine and Harbours has made a commitment to liaise with the Bunbury Port Authority to reduce dust levels to the satisfaction of the City of Bunbury (39 DMH). The Environmental Protection Authority understands that the Bunbury Port Authority would be able to ensure reduced dust levels were achieved.

5.5.4 Odour

As indicated in the Public Environmental Review the marina development is within the Water Authority of Western Australia buffer zone for the waste water treatment plant (See Map 7, page 67 of PER). The Water Authority of Western Australia has prepared a draft policy which identifies acceptable and unacceptable land uses within waste water treatment plant buffer zones. The Water Authority of Western Australia has advised that under this policy, the marina development would be an acceptable land use within the buffer zone.

5.5.5 Traffic management

Potential conflicts between trucks hauling to the Outer Harbour and boat trailer traffic seems likely. A report to the South West Development Authority in 1989 noted that typically 1 200 vehicles per day, including about 200 trucks, move through the project area towards the Outer Harbour. The number of trucks increase to about 700 truck movements per day twice per month and during the non-summer months to up to 1 200 truck movements per day once every four weeks. During peak operations trucks run through the day and night.

The South West Development Authority has made a commitment to upgrade roads if necessary. Traffic management should be considered in detail by planning authorities.

5.5.6 Public access and cycleways

The design and commitments should ensure adequate public access to the marina facility.

The proponent has made a commitment to construct cycleways in accordance with the Environmental Guidelines (44 DMH). This is endorsed.

5.5.7 Aesthetics and local flora

Within the area proposed for the marina there is little, if any indigenous flora and fauna. The Public Environmental Review indicates that a landscape plan will be prepared and implemented

which includes indigenous species (See page 37) and environmental commitment 37 DMH states that the landscape plan will be implemented to the satisfaction of the Environmental Protection Authority. The Authority endorses the concept of a landscape plan which includes indigenous flora.

6 Environmental assessment - Rezoning

The Environmental Protection Authority considers there is both insufficient information and sufficient uncertainty in the information provided to assess the environmental acceptability of the proposed rezoning from an area currently predominantly zoned for Industrial uses to Special Use (Bunbury Harbour City) and therefore considers that approval for the rezoning should be withheld at this stage. Several of the key environmental issues associated with the proposed rezoning may take some time to resolve.

If the proponent wishes to pursue the vision of changing land use in this area, the Authority has identified issues which should be resolved and has endeavoured to link resolution of these issues with the planning approval process so that ultimately a joint environmental/planning decision results. By linking the environmental and planning approval procedures, a more rapid decision making process should be achieved.

6.1 Key environmental/planning issues

The issues under this heading are environmental issues which significantly affect future planning of the area proposed to be rezoned to Special Use (Bunbury Harbour City). Some of the issues affect whether or not rezoning should proceed, whilst others significantly affect structure planning.

6.1.1 Noise

One of the most frequently raised issues in the public submissions was the incompatibility of traffic noise resulting from existing mineral sands operations with noise-sensitive land uses proposed in the rezoning, and the location of those noise-sensitive land uses presented in the structure plan of July 1990 (See Figure 4).

A report to the South West Development Authority in 1989 noted that typically 1 200 vehicles per day, including about 200 trucks move through the project area towards the Outer Harbour. The number of trucks increase to about 700 truck movements per day twice per month and during the non-summer months to up to 1 200 truck movements per day once every four weeks. During peak operations trucks run through the day and night. One public submission considered that truck noise levels had been measured at 85 dBA at 7 m.

Concern was expressed that continued use of the infrastructure at Outer Harbour should not be jeopardised because of complaints about traffic and traffic noise. Current industrial land uses along and near the access to Outer Harbour in the area proposed to be rezoned do not include noise-sensitive premises.

Substantial concerns were also raised that the noise management measures proposed (5 & 6 SWDA) would not be able to reduce noise levels to levels currently acceptable or likely to be acceptable to the Authority at noise-sensitive premises. Appendix 3 defines noise-sensitive premises and defines noise levels which would be acceptable to the Authority at those premises.

The Environmental Protection Authority considers that noise-sensitive premises and land uses should not be located in areas affected by noise levels in excess of those noted in Appendix 3 from existing truck traffic to the Outer Harbour.

In response to concerns raised in the public submissions, the South West Development Authority has engaged a noise consultant.

The South West Development Authority is also a participant in the Mineral Sands Task Force established by the Minister for Planning which is considering the issue of continued use of the Mineral Sands loading facilities at the Bunbury Outer Harbour. **The Environmental Protection Authority understands that the recommendations of the Mineral Sands Task Force could significantly affect issues associated with traffic noise.** For example, if the Task Force recommends relocation of Outer Harbour facilities should not occur during the useful life of the existing facilities, the structure plan of July 1990 would most likely need to be amended in response to the noise consultants report. Alternatively, if the Task Force sets a definite time-frame for relocation of Outer Harbour facilities to the Inner Harbour, then the time-frame for the rezoning can be matched so that approvals coincide with closure of Outer Harbour facilities. Therefore, the Authority considers it is premature to attempt to resolve the noise issue at this stage.

6.1.2 Risks and hazards

To fulfil the requirements of the Environmental Protection Authority's guidelines for the Public Environmental Review the Waterways Commission initiated a hazard analysis of activities that may impact on the Bunbury City Harbour Development. The full hazard analysis, which was completed approximately two years ago, contains confidential information and a summary has been included in the Public Environmental Review document.

On request from the Environmental Protection Authority the Department of Minerals and Energy has undertaken a review of the full hazard analysis. The Department of Minerals and Energy has advised the Authority that whilst there have been a number of changes to the hazards over the last two years that affect details of the report, the conclusions and recommendations included in the Public Environmental Review generally apply.

The hazard analysis indicates that the levels of risk for a small part of the existing residential zoned land to the south of Apex Drive exceed the Environmental Protection Authority's risk criteria for residential areas of "one in a million" (Bulletin 611). The risks are primarily from the fuel storage tanks. The proposed development "will require alternative facilities [fuel storage tanks], preferably in the Inner Harbour". This would remove these hazards, which is in accordance with the Environmental Protection Authority's recommendations, given in Bulletin 611 - "Where such land uses [which exceed the criteria] are identified a programme should be developed to alter the land use or reduce the risks so that the current criteria can be met".

The proponent has made a commitment not to proceed with residential development or holiday accommodation within the area bounded by the "one in a million" contour until the hazards have been removed, to the satisfaction of the Environmental Protection Authority (8 SWDA).

Importation of other hazardous materials through the outer harbour, such as ammonium nitrate was only qualitatively addressed in the hazard analysis. If the Outer Harbour is to be used for the importation of hazardous materials further analysis is required on the hazards, including the loading, unloading, transshipment and transport of such materials. The commitments by the proponent do not reflect the regulatory control of transporting ammonium nitrate (7 SWDA).

The Environmental Protection Authority does not issue licences to transport and load ammonium nitrate, nor does the Department of Minerals and Energy. The Department of Minerals and Energy, however, does have regulations which cover the transport and handling of ammonium nitrate and it is appropriate that any modification of the current approved practices be to the satisfaction of the Department of Minerals and Energy.

An alternative approach to undertaking further hazard analysis work with regard to the continued use of the Outer Harbour for hazardous materials would be to also give consideration to relocating those activities to the Inner Harbour. This approach would be consistent with the Environmental Protection Authority's philosophy of "avoiding avoidable risks" in that a comparison could be made on the risks associated with siting the hazards adjacent to (with hazardous materials being transported through) what is intended to be a popular tourist area, to siting the hazards in the Inner Harbour.

The Authority considers that further hazard analysis work with regard to the continued use of the Outer Harbour for hazardous materials should also give consideration to relocating those activities to the Inner Harbour so that a comparison can be made on the risks associated with siting the hazards adjacent to (with hazardous materials being transported through) an intended tourist area, to siting the hazards in the Inner Harbour.

6.1.3 Clean-up of site contamination

Site contamination may have occurred from past uses of the land which is proposed to be rezoned. The Authority is aware of similar industrial areas which included uses such as the State Engineering Works, where significant soil contamination has been found.

The proponent has made a commitment to assess contamination levels below the fuel storage facilities (11 SWDA), but not at other sites.

Prior to redevelopment each lot of land previously used for industrial purposes, such as engineering works, fuel storage facilities or for grain storage should be assessed to determine the likelihood of contamination and then be assessed accordingly to determine whether or not unacceptable site contamination has occurred.

As different end land-uses require different clean-up standards, it is important that a structure plan is prepared which accurately reflects intended land use prior to this issue being further assessed by the Environmental Protection Authority. The proponent has indicated that the Structure Plan of July 1990 should not be used as a basis for assessing the acceptability of land uses.

As there has not yet been any investigation of site contamination levels, it has not been possible for the proponent to adequately determine the cost, and therefore the feasibility, of making each parcel of land suitable for the proposed use. Although the cost of remediation is a matter for the proponent to consider, this may affect the ultimate pattern of development in the area which may be an issue of concern to planning authorities.

The Environmental Protection Authority considers that prior to a rezoning being finalised by Council, each existing lot should be assessed, managed and cleaned-up for the land use proposed in an associated structure plan (yet to be prepared) in accordance with the joint Australian and New Zealand Environment and Conservation Council/ National Health and Medical Research Council guidelines for the assessment and management of contaminated sites.

6.1.4 Odour

As indicated in the Public Environmental Review much of the area proposed to be rezoned is within the Water Authority of Western Australia buffer zone for the waste water treatment plant (See Map 7, page 67 of PER). The Water Authority of Western Australia has prepared a draft policy regarding land uses within waste water treatment plant buffer zones. Under this policy

most of the land uses proposed in the Special Use (Bunbury Harbour City) zone would not be acceptable to the Water Authority. For example, the draft policy considers that residential zones, tourist complexes, offices and retail outlets are unacceptable land uses within a buffer zone.

The proponent has made a commitment to proceed with development consistent with the Water Authority of Western Australia Draft Policy regarding land-use within the wastewater treatment plant buffer zones until the plant is relocated or managed in a manner which enables a reduction in the size of the buffer zone to the satisfaction of the Water Authority of Western Australia (9 SWDA). The proponent has re-worded this commitment to reflect the draft Water Authority policy. The Environmental Protection Authority expects that a reduction in the size of the buffer zone is unlikely.

The Water Authority of Western Australia has indicated that relocation of wastewater treatment plant by 1996 as suggested in the Public Environmental Review document is not certain. Proposals to direct sewage away from this plant are currently being supported by the Commonwealth, but should this funding not be maintained, the Water Authority would postpone the re-direction of sewage and hence the closure of the site because of the high costs involved.

The Authority suggests that the likelihood of the waste water treatment plant being re-located should be more certain before rezoning is approved.

6.2 Other environmental issues

6.2.1 Sewerage provision

Given the soil type, height of the water table and proximity of the marina waterbody the Environmental Protection Authority considers it is essential that the area affected by the proposed rezoning is serviced by reticulated sewerage. The Public Environmental Review does not indicate a commitment to connect the residential area or tourist development to sewerage. The Authority has been advised by officers of the Department of Planning and Urban Development that connection to sewerage would be incorporated as a condition of subdivision and/or development.

6.2.2 Drainage

Stormwater often carries nutrients from recently applied fertiliser and other sources, hydrocarbons such as oil and grease which leak from cars, and heavy metals such as lead from petrol. The issue of stormwater drainage has not been addressed for the rezoning component of this proposal, although it was considered with respect to the marina development. **The Environmental Protection Authority considers that the drainage system should maximise on-site retention of stormwater and that drainage should not be discharged direct through pipes into the marina or the ocean. As a minimum, a one-in-ten year storm event should be retained on site.**

The Authority would endorse proposals to utilise the water conserving design principles as they usually also manage water quality impacts better than conventional practices.

6.2.3 Nutrient management

Given the soil type, height of the water table and proximity of the marina waterbody the Environmental Protection Authority considers that nutrient management is an issue in this area. The proponents commitment that developers be required, as a condition of development, to prepare nutrient and irrigation management plans is endorsed. Given this commitment the Authority has assumed that nutrient and irrigation management will be an integral part of the landscaping plans (19 & 20 SWDA) and the foreshore management plan (17 & 18 SWDA).

The Authority recognises that preparation of nutrient and irrigation management plans is not able to be applied to individual residential developments. However, utilising and encouraging water conserving design principles would assist in reducing nutrient loads in stormwater.

6.2.4 Coastal setback and coastal management

On the western side of the area proposed to be rezoned the proponent has made a commitment to incorporate the extension of Ocean Drive to create a foreshore reserve (16 SWDA). This would achieve a setback of about 60 to 80m for most, but not all of the western foreshore. The vacant Crown land identified at the northern end of Ocean Drive may also have to be incorporated into the foreshore reserve. The Department of Planning and Urban Development Policy 6.1 guideline specifies a 100m coastal setback.

Under Department of Planning and Urban Development Policy 6.1 marina developments such as proposed on the eastern side of the proposal are considered on a case-by-case basis.

The proponent has made a commitment to preparing and then subsequently implementing a management plan for adjacent foreshore areas to the satisfaction of the City of Bunbury and the Coastal Management Branch of the Department of Planning and Urban Development (17 & 18 SWDA).

The required coastal setback and adequacy of the foreshore management plan should be determined by the City of Bunbury and the Department of Planning and Urban Development.

6.3 Other issues

6.3.1 Dust

The Authority understands that dust from trucks going to the Outer Harbour is no longer a problem because all trucks have covers over their loads.

Dust from loading operations at the Outer Harbour has been a problem. However several mineral sands companies indicated in their submissions to the Public Environmental Review that they were committed to eliminate dust problems during ship loading. The Department of Marine and Harbours has made a commitment to liaise with the Bunbury Port Authority to reduce dust levels to the satisfaction of the City of Bunbury (39 DMH). The Environmental Protection Authority understands that the Bunbury Port Authority would be able to ensure reduced dust levels.

6.3.2 Traffic management

Given the traffic flows in this area (See 5.5.5) it seems likely that there would be potential for conflicts between trucks hauling to the Outer Harbour and traffic generated by the land uses associated with the rezoning, particularly residential, tourist and office traffic. Issues of pedestrian/vehicle conflict may also need to be examined.

The South West Development Authority has made a commitment to upgrade roads if necessary (12 SWDA) and to liaise with Bunbury Transit in an effort to extend bus routes to the area (14 SWDA). Traffic management should be considered in detail by planning authorities.

6.3.3 Heritage

Appendix 4 to the Public Environmental Review was a report on the European History associated with the area affected by the marina and rezoning proposal. The proponents response to public submissions states that the proponent is committed to preserving the historic/heritage values of the area and that consultation with the Heritage Council of WA will be undertaken when considering redevelopment of any historic sites in the area. The proponent has also

provided a commitment to incorporate historic sites into the development to the satisfaction of the Western Australian Museum (21 SWDA).

6.3.4 Cycleways

The proponent has made a commitment to construct cycleways in accordance with the Environmental Guidelines (15 SWDA). This is endorsed.

7 Conclusion and recommendations

7.1 Marina development

For the purposes of drawing conclusions and making recommendations regarding this part of the Bunbury Harbour City Development proposal the Environmental Protection Authority has considered only the marina development itself and not the acceptability of land uses proposed for the reclaimed land.

Recommendation 1

The Environmental Protection Authority has concluded that the proposed marina development at Bunbury Harbour, as modified during the process of interaction between the proponent, the Environmental Protection Authority, the public and Government agencies is environmentally acceptable.

In reaching this conclusion the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as;

- **management and design to ensure acceptable marina water quality;**
- **design to minimise effects of climate and sea level changes possible from the Greenhouse Effect;**
- **construction impacts; and**
- **protection of resident dolphins.**

The Environmental Protection Authority considers that these environmental factors have been addressed adequately by either environmental commitments by the proponent or by the Environmental Protection Authority recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the marina development could proceed subject to the Environmental Protection Authority recommendations in this report and the proponents environmental commitments (Appendix 1).

The Authority considers that the proponent's commitments have adequately addressed many issues including management of water quality (with the exception of sullage management), Greenhouse gas effects, on-going management of the marina, oil spill contingency, public access and most construction impacts including protecting the resident dolphins, dust and noise.

Recommendation 2

The Environmental Protection Authority recommends that prior to any excavation of beach sand for the marina development the Department of Marine and Harbours should determine;

- the coastal stability of Point Casuarina beach (ie where the sand is to be removed from);
- the implications of sand excavation on adjacent beaches to the south and to the north; and
- the approximate amount of sand which may be taken from the beach (in cubic metres) from Point Casuarina Beach without adversely affecting the amenity of this and other beaches in the area,

to meet the requirements of the Environmental Protection Authority on advice of the Department of Planning and Urban Development.

Recommendation 3

The Environmental Protection Authority recommends that prior to the Department of Marine and Harbours leasing any mooring or pens within the marina development, the Department make arrangements to provide for sullage tank effluent disposal at the marina development, to the requirements of the Environmental Protection Authority.

7.2 Rezoning

Recommendation 4

The Environmental Protection Authority considers that before it assesses the environmental acceptability of the proposed rezoning from an area currently predominantly zoned for Industrial uses to Special Use (Bunbury Harbour City) the proponent needs to consider in more detail;

- the location of noise-sensitive land uses in areas which may (depending on the outcome of the Mineral Sands Task Force) be affected by high noise levels from trucks servicing the Outer Harbour;
- hazard analysis, particularly with respect to assessment of alternative sites for the importation of hazardous materials, such as ammonium nitrate;
- potential site contamination on each existing lot from historical and current operations such as existing fuel storage tanks and engineering works;
- relocation of the existing waste water treatment plant so that odours do not preclude development; and
- stormwater drainage design criteria.

The Environmental Protection Authority recommends that the rezoning not proceed at this time and recommends the Minister for the Environment seeks re-assessment pursuant to Section 43 of the Environmental Protection Act after the proponent has adequately addressed the above matters.

On the basis of the above recommendation, it would be appropriate for the Minister to issue a statement giving conditional approval to the marina and withholding approval for the rezoning while these issues are resolved.

The Environmental Protection Authority recognises that it may be some time before issues noted above are resolved, such as whether or not operations such as mineral sands loading and importation of ammonium nitrate at the Outer Harbour are to be re-located. These issues significantly affect the environmental acceptability of the proposal.

The Environmental Protection Authority suggests that if the proponent wishes to pursue the vision of changing the land use in the area covered by this proposal to residential and tourist uses, the issues of concern to the Authority could be addressed through a publicly available structure plan in parallel with environmental documentation.

Implementing of the above suggestion and recommendation would explicitly link the environmental and planning approval procedures, so that a more rapid decision making process could result when issues are resolved.

Appendix 1

Proponents Commitments

(and summary of amendments)

To provide adequate public access for future developments on the rezoned land SWDA will:

- 15 (SWDA) provide dual use paths throughout development in accordance with Environmental Guidelines for Dual Use Paths.

To provide adequate foreshore reserves for future developments on the rezoned land and ensure consistent management SWDA will:

- 16 (SWDA) following the relocation of the wastewater treatment plant and the petroleum storage facilities request the Department of Land Administration to incorporate the road reserve, which forms the northern extension of Ocean Drive, into Reserve Pt 18574 for foreshore management.

- 17 (SWDA) prior to residential development on the rezoned land have prepared management plans for adjacent foreshore areas to the satisfaction of the City of Bunbury and the Coastal Management Branch of DPUD.

Management plans to address of the following:

- retention of foreshore vegetation and revegetation if necessary.
- provision of facilities i.e. toilets, picnic areas, car parks etc.
- establishment of suitable means of public access.
- protection of environmentally sensitive areas.
- maintenance of shoreline stability.
- protection of visual amenity.
- provide for recontouring.

- 18 (SWDA) implement management plans as a condition of development.

To protect historic sites on the rezoned land SWDA will:

- 21 (SWDA) incorporate historic sites into the development to the satisfaction of the Western Australian Museum.

1.2 Marina Management Commitments

1.2.1 Construction Management Commitments

To minimise the environmental impacts of the construction of the Marina Complex identified in this PER, the Department of Marine and Harbours will undertake the following management strategies.

To minimise the disturbance to landform DMH will:

- 1 (DMH) minimise fill levels by filling only to a level necessary for engineering purposes taking into account the predicted impact of the Green House Effect.

To maintain water quality during construction DMH will:

- 3 (DMH) Limit sea bed excavations to no more that one continuous week with daily hours of operation not exceeding ten hours.

To protect historical sites and artifacts during construction DMH will:

- 28 (DMH) give the Bunbury Historical Society seven days notice prior to removal of designated sections of the Bunbury Jetty.

1.2.2 Operational Management Commitments

To minimise the environmental impacts of the operational phase of the Marina Complex identified in this PER the Department of Marine and Harbours will undertake the following management strategies.

To maintain water quality within the marina DMH will:

- 29 (DMH) contain stormwater on site as a policy. Locate, design and construct all stormwater disposal systems to the satisfaction of the EPA and the City of Bunbury.
- 32 (DMH) dispose of all sewage via reticulated deep sewerage to the satisfaction of WAWA. Liaise with WAWA to prepare adequate contingency plans in case of system failure.
- 34 (DMH) develop and implement a Marine Management Programme as outlined in Section 1.2.3 and to the satisfaction of the EPA.
- 35 (DMH) develop a contingency plan for accidental oil spills within the marina waters to the satisfaction of the EPA. In the contingency plan address contingencies for fire and explosions, collision between vessels, fuel and oil pollution, bombs and hazardous devices, toxic gas leaks, sewage and effluent spills and hazardous chemical spills. Trial the contingency plan immediately following construction of Stage 1 of the Marina Complex.

To minimise the impact of the Marina Complex on the aesthetics of the area DMH will

- 37 (DMH) landscape the site following completion of construction in accordance with the landscape plan prepared for the area by (SWDA) to the satisfaction of the EPA.

To minimise the impact of industrial risk associated with existing activities on the Marina Complex DMH will:

- 38 (DMH) prohibit public access to and use of the Marina Complex whilst transportation and loading of ammonium nitrate is occurring to the satisfaction of the Department of Mines.

To minimise the impact of dust on the Marina Complex DMH will:

- 39 (DMH) liaise with Bunbury Port Authority to reduce dust levels from mineral sands loading facilities in Bunbury Outer Harbour to the satisfaction of the City of Bunbury.

To provide suitable landform to facilitate future development on the rezoned land SWDA will:

- 2 (SWDA) recontour adjacent to Marlston Hill in accordance with plans approved by the City of Bunbury.

To minimise the impacts of future development on the rezoned land on flora, fauna and conservation values of the area SWDA will:

- 3 (SWDA) work with LIMA, DPUD and the City of Bunbury to prepare educational information to raise public awareness relating to use of the environment and protection of conservation values.
- 4 (SWDA) support the implementation of the Koombana Park Reserves Management Plan being developed by the City of Bunbury and LIMA

To provide adequate road systems and car parking facilities for future development on the rezoned land SWDA will:

- 12 (SWDA) improve road systems when necessary to allow for increased traffic.
- 13 (SWDA) incorporate parking facilities into all future developments in accordance with plans approved by the City of Bunbury.
- 14 (SWDA) liaise with Bunbury Transit to extend bus routes from the central city to the rezoned land.

To protect and enhance the visual amenity of the rezoned land SWDA will:

- 19 (SWDA) prior to development of each site within the study area have prepared a landscape plan to the satisfaction of the City of Bunbury. The landscape plan will include consideration of the use of appropriate building design and materials, scale, form and landscaping.
- 20 (SWDA) implement the landscape plan as a condition of development.

2.2 Marina Management Commitments

2.2.1 Construction Management Commitments

To minimise the environmental impacts of the construction of the Marina Complex identified in this PER, the Department of Marine and Harbours will undertake the following management strategies.

To minimise the impact of construction on flora and fauna of the area DMH will:

- 11 (DMH) preserve existing vegetation wherever possible.

To ensure public safety during construction DMH will :

- 24 (DMH) construct fencing and erect appropriate signs to restrict public access to the site to the satisfaction of the City of Bunbury.

Bunbury Harbour City Redevelopment Summary of Amendments to Proponent's Commitments

Commitments made by the South West Development Authority

Commitment 7(SWDA) amended as there is no licence to transport and load ammonium nitrate. A general Mines Department approval exists for the transport and loading activity and licences are issued for each separate operation.

Commitment 8(SWDA) amended to be to the satisfaction of the Environmental Protection Authority.

Commitment 9(SWDA) amended to be to the satisfaction of the Western Australian Water Authority.

Commitment 10(SWDA) amended to be to the satisfaction of the Environmental Protection Authority.

Commitment 11(SWDA) expanded to include any drilling necessary (not only shallow drilling) and the treatment of any contamination (not just removal).

Commitments made by Department of Marine and Harbours

Commitments 2(DMH),17(DMH)and 18(DMH) have been incorporated into Commitment 15 as these activities all related to the control of dust and are covered under the EPA Dust Control Guidelines deal with the same

Commitment 3(DMH) amended to expand the operational hours for sea bed excavation to 10 hours per day for one week only. This will still allow 14 hours for any turbid plume to disperse.

Commitment 4(DMH) amended to allow the use of sand for fill only from the sand trap adjacent to the groyne on the ocean side of Casuarina Breakwater and not all adjacent beaches.

Commitment 5(DMH) amended to be to the satisfaction of the Environmental Protection Authority.

Commitments 6(DMH) and 7(DMH) amalgamated so as combine the monitoring and treatment of dewatering discharge.

Commitment 8(DMH) amended to include building construction wastes and to be to the satisfaction of the City of Bunbury.

Commitment 9(DMH) amended to be to the satisfaction of the City of Bunbury.

Commitment 12(DMH) deleted and incorporated into Commitment 37(DMH) as it was considered repetitive.

Commitment 13(DMH) amended to include compliance with the regulations for blasting.

Commitment 14(DMH) amended to include consultation with the Bunbury Dolphin Trust.

Appendix 2

Summary of submissions and proponents response

- 1.7 The Mineral Sands Industry is committed to eliminate any dust problems occurring during ship loading.

Dust emanating from the loading of Mineral Sands in the Outer Harbour has been observed during development of the proposal. This was considered to be a problem which may impact on the proposed marina and its associated facilities. The proponent is pleased to see this issue will be addressed by the Mineral Sands Industry themselves.

- 1.8 Wheat/Grain silos unattractive and give impression of an industrial area. Need to consider visual impact on the area, whether the silos should remain and/or ways to make them attractive.

A large portion of the Wheat/Grain Silos has recently been removed. The remainder, however is considered to play an important role in the preservation of the cultural heritage of Bunbury. Any development of the silos will be architecturally incorporated into the landscape and the rest of the Bunbury Harbour City Redevelopment Concept.

- 1.9 No new residential, tourist (including the marina) commercial or food processing establishments should be permitted within 500m of the Wastewater Treatment Plant. This could be relaxed to the extent consistent with existing industries when the Plant is relocated.

The proponent is aware of the restrictions placed on landuses within the 500 m buffer zone around the Wastewater Treatment Plant and is committed to not proceeding with residential or tourist development until the plant is relocated or managed in a manner which will reduce the buffer zone. In regard to the development of the marina within the buffer zone the Water Authority of Western Australia has provided advice that development of the marina may proceed within the buffer zone, however associated facilities including the preparation or sale of foodstuffs are to be precluded. This advice is in accordance with the Draft Policy for Waste Water Treatment Plant (WWTP) Buffer Zones developed by the Water Authority. The proponent is committed to proceeding with development in accordance with this policy.

- 1.10 Note that, with exception of removal of portion of old Bunbury jetty historic/heritage to be incorporated into development. Proposals to redevelop or demolish historic/heritage sites should be referred to the Heritage Council of WA.

The proponent is aware of their obligations under all areas of heritage legislation and is committed to preserving the historic/heritage values of the area. Consultation with the Heritage Council of WA will be undertaken when considering development of any historic sites in the area.

City of Bunbury For this reason, as explained in the PER alternative sites have not been evaluated.

Studies also indicated that to cater for the increasing resident and visitor populations of Bunbury there is a need to supply facilities and services currently lacking. The studies indicated that a residential tourist mix of land use would provide these facilities and services whilst also enhancing the visual amenity of the City's central area. This mix of land use was seen to provide the most community benefit.

- 2.7 Concerned at lack of attention to cartage requirements (mineral sands and fertiliser) into and out of Outer Harbour particularly with respect to potential economic impacts (particularly on business) of any noise limitations affecting cartage. Economic impacts and support of business to the community largely ignored.

Detailed analysis of the requirements of the Mineral Sands industry have been undertaken during development of the proposal . Negotiations with the industry are currently being carried out to determine the most appropriate long term solution to the location of the mineral sands industry. In the interim the proponent recognises the economic benefits of the industry to the community are high and is committed to ensuring the continuation of this industry. The redevelopment proposal has been designed (including set backs on residential areas and redesign of road systems) to allow for the continuation of cartage to the Outer Harbour. Any further development will take into account the need for continuing access for the Mineral Sands Industry.

- 2.8 No analysis of projected costs or relocation costs. Such an analysis would have better addressed industry's concerns and enabled cost/benefits to be highlighted.

It is considered that it is not the role of the PER Report to provide a detailed economic feasibility study for the proposal. Instead the PER provides an environmental impact study which addresses the need for the development in a general sense as required by the EPA Guidelines. Detailed analysis of costs involved in relocating industry in the long term (including Mineral Sands loading facilities, Petroleum Storage Facilities, Westrail Facilities and the Wastewater Treatment Plant) to allow the proposal to proceed have been carried out. A proposal of this magnitude would not be considered feasible if the benefit to the community, including industry was not high.

- 2.9 The PER does not adequately address the possibility of soil contamination from past or adjacent land uses.

- 2.10 What measures are to be taken to prevent the contaminants discovered from reaching the water table.

Section 7.1.3.5 of the PER identifies that an investigation into the groundwater environment of the study area has revealed the possible occurrence of contaminants in soils and groundwaters. The proponent has committed themselves to undertaking exploratory drilling , soil and water sampling and vapour detection of groundwaters in the area of the petroleum storage tanks prior to development of this land. If these investigations reveal contamination removal or treatment of the contamination will be carried out. Any measures taken will be to the satisfaction of the Environmental Protection Authority.

4 Outer harbour traffic impacts

- 4.1 The proponent should be required to complete a comprehensive technical assessment of the impact of heavy haulage vehicles in order to provide an acceptable structure plan. Commitments 5 & 6 do not assess feasibility of proposed solutions.
- 4.2 Heavy vehicles generate 85 dB(A) at 7.5m. Using **only** distance a setback of 480m to residential areas would be required.
- 4.3 Traffic noise would affect people living at proposed residential areas and the marina.
- 4.4 Plan (Eg Figure 3) should show road design, width, traffic islands, landscaping and noise profiles to residential areas from the main access road to the Outer Harbour, because this road is used 7 days a week, 24 hours a day by mineral sands trucks.

During initial stages of the assessment of the proposal the Environmental Protection Authority identified traffic noise to be a major issue in the environmental acceptability of the project. The proponent was asked to carry out further investigations into the noise generated by Mineral Sands haulage trucks and hence arrive at a suitable setback for residential areas. Results from these investigations are still to be finalised and will be discussed in detail with the Environmental Protection Authority. Any resolution in regard to reducing noise impact on proposed land uses will not compromise the continued access of the Mineral Sands Industry through the Harbour City area.

In the interim the impact of noise from the mineral sands haulage trucks on the first stage of the marina is considered to be low. The marina will be for the purpose of boat mooring only with no established provision for living on board vessels while the boat launching ramp will be for the purpose of launching boats and parking cars and trailers. Traffic noise will have minimal affect on people using these facilities.

- 4.5 No details on how conflict between expected significant increase in mineral sands truck traffic/ heavy haulage vehicles (shipping requirements to be increased by 60% for one company) and traffic using marina complex is to be resolved (P 32). Information provided on Page 56 inadequate to determine acceptability of impacts after implementation (ie there is no technical analysis)
- 4.6 Pedestrian & tourist/heavy vehicle conflict not properly considered.

There is already a conflict between mineral sands traffic and vehicles using Koombana Road and inner city roads. Traffic studies show that the proposed upgrading of road access will be able to serve both mineral sands trucks and car/trailers adequately and that vehicles using the marina will not increase traffic conflict significantly. Traffic control measures such as stop signs will be taken at the entry to the boat launching facility if required by any future detailed road design. Pedestrian safety will also be taken into account in road design features .

At this stage in the proposal the nature of development proposed on the rezoned land is still to be defined. The Special Use Zone proposed, however, includes land uses such as residential, tourist, and commercial. These land uses in general terms are considered to be able to co exist without conflict. In further defining the nature of development that is to occur, any conflict (presumably of a minor nature) between landuses will be identified. These conflicts will be minimised by careful planning.

5.9 Relocation of wastewater treatment plant a critical issue.

5.10 Relocation of wastewater treatment plant by 1996 not certain. Proposals to direct sewage away from this plant are currently being supported by the Commonwealth, but because of the high costs involved should the funding not be maintained, the Water Authority would postpone the re-direction of sewage and hence the closure of the site. A buffer must be maintained until plant closes.

The proponent is aware of the high costs and environmental sensitivities of relocating the wastewater treatment plant. This is an issue which will be treated with extreme caution. As the implementation of residential areas within the Bunbury Harbour City Redevelopment Proposal are depend on the plant's relocation the proponent is committed to its relocation. Relocation will be a long term strategy and will involve evaluation of suitable sites for the plant with appropriate environmental impact assessment. In the short term as indicated in response to 1.9 the proponent is committed to the maintenance of the buffer zone and the restrictions on land use within this zone.

5.11 Ports are a scarce essential resource built for long term usage. Planning must be on a long term basis and ensure user access.

Long term planning for the development of the Port of Bunbury is an essential part of the development of Bunbury as a city. Regional planning mechanisms have identified the focus of further port development will be on the Inner Harbour. Infrastructure and facilities centralised in one location will make port operations easier. Ensuring user access is a major consideration that will be taken into account when planning for expansion of the Inner Harbour.

5.12 The building of condominiums, festival retail lots, beach village and lodge, industrial lease lots and the boat ramp and associated car park (Figures 2 & 3 of PER) are totally inconsistent with on-going use of the outer harbour for mineral sands transport, which has been the backbone of Bunbury's ports for 35 years.

The PER has addressed the impact of the Marina on Outer Harbour operations. The use of water and land areas for maritime recreation is in fact consistent with the Special Use Zoning and will allow a suitable buffer between the Outer Harbour and the Inner City area. It will also provide a highly desirable water focus for future development of the city. The existing level of conflict of use between port operations and recreational boating will remain for the first stages of the development. The current level of conflict is considered acceptable by the boating public. Although shipping movements in the Outer Harbour are expected to decline in the longer term, a separate entrance to the marina is to be constructed in the latter stages of marina development.

5.13 If traffic noise setback required for residential areas is large this would significantly affect structure plan. Must be considered at this stage.

5.14 Future residents and visitors would not expect the amenity of the area to be affected by heavy vehicles.

The issue of noise has been identified as a major issue in the proposal which needs to be addressed further. This issue is further discussed in response to 4.1 - 4.4.

6 Marina development

- 6.1 Marina development, whilst not critical, is an important adjunct to any proposed tourism development.

The proponent agrees with the above comment. The provision of a waterfront focus in any tourist development is an important element in the Western Australian environment.

- 6.2 Concerned may be conflict between users of marina (ie large commercial vessels and pleasure boats), particularly during the construction phase of the development. If the channel from Bunbury Outer Harbour to Casuarina Harbour is narrow commercial vessels may have difficulty turning.

Refer response given for 5.12. In addition the construction phase will be coordinated with the Bunbury Port Authority operations to ensure continued safe operation of the harbour and minimal inconvenience to recreational boating. There is sufficient width in the Outer Harbour's navigation channel to allow safe manoeuvring of shipping.

- 6.3 Circulation modelling is possibly an optimistic estimate of the flushing, rather than conservative.

The circulation modelling shows that the proposed new entrance channel will most likely improve the flushing characteristics of the marina basin. The conclusion that flushing times will not increase is therefore conservative.

- 6.4 PER includes conflicting statements about when sewage pump out facilities will be installed (Compare page 9 with 32). Sewage pump out facility must be provided at construction stage.

A sewage pumpout facility will be constructed when 100 pens have been constructed and leased. There are already approximately 50 boats on swing moorings in the harbour of which few if any have sullage tanks. It is expected that most of these boats will shift to the proposed marina. Of the boats taking up the remainder of the 100 pens, the proportion having sullage tanks is expected to be small. Nevertheless, a sullage pumpout facility will be provided when 100 pens are occupied in anticipation of legislation enforcing the installation and use of boat sullage tanks.

- 6.5 Any slipping facilities installed should have trapping systems to minimise accumulation of heavy metals in sediments of the marina.

The proponent agrees with the installation of trapping facilities in any drainage outlets from slipping facilities or other boat maintenance areas. The proponent is committed to intercepting all runoff with sediment traps and grease baffles (DMH Commitment 30).

- 6.6 In the construction of rock groynes and causeways techniques should be used which will exclude cavities which could provide harbourage for rats.

The proponent considers that the harbourage of rats within rock groynes and causeways is not a major issue as the occurrence of rats in Bunbury is relatively low.

- 6.7 We support the management and monitoring strategies proposed by the Waterways Commission.

8 Dolphins

- 8.1 The Dolphins at Koombana Bay are resident (ie Dolphins visit regularly and are seen at least three times per week), not occasional visitors. The Dolphins feed in Koombana Bay.
- 8.2 The Dolphins are being studied by the Bunbury Dolphin Trust in liaison with but not by the Department of Conservation and Land Management.

The two comments in regard to the dolphins are noted by the proponent and an apology offered for the errors made in the PER. The proponent is aware of the impact that blasting and other construction activities may have on the 'resident' dolphin populations within Koombana Bay and is committed to minimising this impact as far as possible. Construction activities will be carried out in accordance with Australian Standards and to the satisfaction of the Department of Mines and the Environmental Protection Authority. Consultation with the Bunbury Dolphin Trust will also occur to determine appropriate times of day to carry out blasting.

Appendix 3

Environmental Protection Authority Noise Recommendations

1 Noise Limits

The proponent should conduct operations so that noise emissions do not unreasonably impact on the surroundings.

1-1 The proponent shall ensure that noise emissions do not exceed:

- 40 dB L_{A10} , 1 hour slow and 50 dB $L_{A \max}$ slow between 2200 hours and 0700 hours on any day when measured on any noise-sensitive premises;
- 45 dB L_{A10} , 1 hour slow and 55 dB $L_{A \max}$ slow between 1900 hours and 2200 hours on any day, and between 0700 hours and 1900 hours on Sundays and gazetted public holidays, when measured on any noise-sensitive premises;
- 50 dB L_{A10} , 1 hour slow and 70 dB $L_{A \max}$ slow between 0700 hours and 1900 hours on Monday to Saturday inclusive, when measured on any noise-sensitive premises; and
- 65 dB L_A slow when measured at or near the boundary of premises that are not noise-sensitive premises (other industries);

where such emissions would result in the noise level present at the affected premises exceeding the ambient noise level present at any time by more than 5 dB L_A slow.

1-2 The proponent shall ensure that noise emissions from those activities which are of concern to occupiers of noise-sensitive premises do not exhibit tones, amplitude and frequency modulation, and impulsiveness of a nature which increases the intrusiveness of the noise.

1-3 The proponent shall conduct noise surveys and assessments in consultation with the Environmental Protection Authority.

The following definitions apply to these conditions:

"ambient noise" means the generally non-intrusive noise which is always present due to such sources as motor vehicles operating on roads (other than those adjacent to the premises where the noise environment is being assessed), general industrial, commercial and other activities where individual noise sources such as fans, machinery, refrigeration and air-conditioning plant and vehicles cannot be identified, and natural noise sources such as wind-induced vegetation noise, but not the noise caused by the allegedly offending source or sources;

"dB L_{A10} , 1 hour slow " means the A weighted noise level exceeded for 10% of the time, determined over a time period of one hour with a sound level meter set to measure in slow dynamic response mode, and

"noise-sensitive premises" means any land or building that is used as a residence, guest house, hotel, motel, caravan park, school, church, hospital, or as an office or consulting rooms, where such office or consulting rooms are not located in an industrial area.