

**Metropolitan Region Scheme Amendment No.
992/33 Clarkson-Butler, Wanneroo**

Western Australian Planning Commission

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

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Summary and recommendations

The Western Australian Planning Commission has initiated Major Metropolitan Region Scheme (MRS) Amendment 992/33 Clarkson-Butler which contains eleven amendments for rezoning and reservation in the north-west corridor of the metropolitan region. Of the eleven amendments, six were considered by the EPA to have the potential to significantly impact on the environment and therefore should be assessed pursuant to Section 48A of the Environmental Protection Act. This report provides the Environmental Protection Authority's (EPA's) advice to the Minister for the Environment on the environmental factors, conditions and procedures relevant to these proposed scheme amendments.

The six proposed scheme amendments subject to assessment under Section 48A of the Environmental Protection Act 1986 are:

1. The rezoning of the south eastern portion of the 'western cell' of Pt Lot 2 Burns from "Rural" zone to the "Urban" zone and "Parks and Recreation" reservation;
2. The rezoning of the northern portion of Lot 17 Marmion Avenue, Clarkson from "Rural" zone to "Urban Deferred" zone;
3. The reservation of two proposed east-west district distributor roads between the Mitchell Freeway and Wanneroo Road for "Other Regional Roads";
4. Adjustments of the existing "Primary Regional Roads" reservation for Wanneroo Road;
5. Reservation of the proposed Mitchell Freeway Transportation Corridor for "Primary Regional Roads" to enable future proposed extensions to the Mitchell Freeway and Northern Suburbs Railway; the reservation of land for "Railways" for the proposed Clarkson Railway Station near Neerabup Road and a possible station near Hester Avenue; and land surplus to Freeway requirements being transferred from "Rural" and "Parks and Recreation" to the "Urban" zone; and
6. The Reservation for the Railcar Stowage and Servicing Depot for "Primary Regional Roads".

For brevity the above proposed scheme amendments are referred to as 'proposals' in this report and the following shortened titles have been used:

- Proposal 1) Pt Lot 2 Burns
- Proposal 2) Lot 17 Clarkson
- Proposal 3) East-west roads
- Proposal 4) Adjustments to Wanneroo Road
- Proposal 5) Mitchell Freeway and Rail System
- Proposal 6) Railcar depot

Environmental Assessment

The Environmental Review Instructions identified 78 preliminary environmental factors associated with the 6 proposals. However, it is the EPA's opinion that the following environmental issues require detailed evaluation in this report:

- (1) *Pt Lot 2 Burns* - impact on regionally significant environmental values;
- (2), (5) and (6) *Lot 17 Clarkson, Mitchell Freeway and Rail System and Railcar depot* - impact on the integrity and environmental values of Neerabup National Park and the east-west linkage between Neerabup National Park and the coast;
 - impact on the amenity of future residents by the Tamala Park Landfill facility;
- (3) *East-west roads* - impact on the integrity and values of Neerabup National Park; and

(4) *Adjustments to Wanneroo Road* - impact on integrity and values of Neerabup National Park and Nowergup Fauna Sanctuary.

Conclusion

The EPA has concluded that Proposals 2 (Lot 17 Clarkson), 3 (East-west roads), 4 (Adjustments to Wanneroo Road), 5 (Mitchell Freeway and Rail System) and 6 (Railcar depot) are environmentally acceptable provided the conditions recommended in Section 4 and set out in Appendix 4 are imposed and enforced.

The EPA considers that Proposal 1 (Pt Lot 2 Burns) is partially environmentally unacceptable as it intends to rezone to "Urban" 115 ha of land considered by the EPA to be of regional conservation value. However, the remaining 55 ha of the south-eastern portion of Pt Lot 2 proposed for "Urban" zone and all of "Parks and Recreation" zone is environmentally acceptable and can be implemented.

Recommendations

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

1. That the Minister notes that the proposed scheme amendment being assessed comprises of six proposals for rezoning and reservation in the north-west corridor of the metropolitan region;
2. That the Minister considers the assessment as set out in Section 3;
3. That the Minister notes that the EPA has concluded that MRS Amendment 992/33 Clarkson-Butler, excluding the rezoning of 115 ha of the south-western portion of the 'western cell' of Pt Lot 2 Burns from "Rural" zone to "Urban" shown in Attachment 1 to Appendix 4, could be implemented provided there is satisfactory implementation by the Responsible Authority of the recommended environmental conditions set out in Section 4, including a referral of the design and construction of Neerabup road to the EPA for assessment under Section 38 of the Environmental Protection Act; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Conditions

Having considered the Responsible Authority's commitments and information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposed scheme amendment is approved. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) Environmental Management Plans including:
 - Vegetation and Fauna Management Plans for Proposals 2, 3, 4, 5, and 6;
 - Construction Management Plans for Proposals 3, 4, 5 and 6;
 - Noise and Vibration Management Plans for Proposals 5 and 6;
- (b) Buffer requirements from Tamala Park Landfill for Proposal 2;
- (c) Stygofauna and Troglotic Fauna Management for Proposal 2;
- (d) Assessment of Karst landforms for Proposal 2; and
- (e) Referral of the design and construction of Proposal 3 to the Environmental Protection Authority.

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1. Introduction

The Western Australian Planning Commission (WAPC), the Responsible Authority, proposes to:

- 1) rezone the south eastern portion of the 'western cell' of Pt Lot 2 Burns from the 'Rural' zone to the Urban zone and Parks and Recreation reservation;
- 2) rezone the northern portion of Lot 17 Marmion Avenue, Clarkson from the 'Rural' and 'Parks and Recreation' zone to the 'Urban Deferred' zone
- 3) reserve two proposed east-west district distributor roads (Hester Avenue and Neerabup Road) between the Mitchell Freeway and Wanneroo Road for 'Other Regional Roads';
- 4) adjust the existing 'Primary Regional Roads' reservation for Wanneroo Road;
- 5) reserve the proposed Mitchell Freeway Transportation Corridor for 'Primary Regional Roads' to enable future proposed extensions to the Mitchell Freeway and Northern Suburbs Railway; the reservation of land for Railways for the proposed Clarkson Railway Station near Neerabup Road and a possible station near Hester Avenue; and land surplus to Freeway requirements being transferred from Rural/Parks and Recreation to the Urban zone; and
- 6) reserve the proposed Railcar Stowage and Servicing Depot between Hester Avenue and Lukin Drive for 'Primary Regional Roads'.

The WAPC has initiated the amendment to fully implement the planned land use zonings and reservations contained within the *North West Corridor Structure Plan* (DPUD, 1992). The Clarkson-Butler amendment will address the inconsistencies of the MRS which currently exist with respect to the Structure Plan in relation to the Parks and Recreation, Primary Regional Roads, Other Regional Roads and Railways reservations and the Urban and Urban Deferred zones (WAPC, 1999a)

In compiling this report, the EPA has considered the relevant environmental issues associated with the proposed scheme amendment, specialist advice from the Department of Environmental Protection (DEP) and other government agencies, and the EPA's own research and expertise.

Further details of the proposed scheme amendment are presented in Section 2 of this report while Section 3 discusses the environmental issues relevant to the proposed scheme amendment. The Conditions and Procedures to which the proposed scheme amendment should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 presents the EPA's Conclusions and Section 6, the EPA's Recommendations.

A list of people and organisations that made submissions is included in Appendix 1. Correspondence received by the EPA on the MRS Amendment from the National Parks and Nature Conservation Authority is included in Appendix 2. References are listed in Appendix 3, and recommended environmental conditions and procedures are provided in Appendix 4.

Appendix 5 contains the summary of the public submissions and the Responsible Authority's responses. The summary of public submissions and the Responsible Authority's responses is produced as a matter of information only and does not form part of the EPA's report and recommendations.

2. The proposed scheme amendment

The WAPC has initiated Major Metropolitan Region Scheme (MRS) Amendment 992/33 Clarkson-Butler which contains eleven proposals for rezoning and reservation in the north-west corridor of the metropolitan region. Pursuant to Section 48A of the Environmental Protection Act the EPA considered that six of the eleven proposals were likely to have significant impact of the environment and therefore considered that the scheme amendment should be assessed through the Environmental Review process.

The Amendment area is located within the Cities of Wanneroo and Joondalup, about 30km north of the Perth Central Business District. The Clarkson-Butler region is located in the coastal area between Burns Beach Road in the south, Romeo Road to the north and the Neerabup National Park to the east (WAPC, 1999e).

The six proposals subject to assessment under Section 48A of the Environmental Protection Act 1986 are shown in a regional context in Figure 1.

A detailed description of the proposed scheme amendment is provided in the Environmental Review (ER) documents (WAPC, 1999a, c, d, e, f, g and h).

Since the release of the ER documents, no modifications to the proposed scheme amendment have been made by the Responsible Authority.

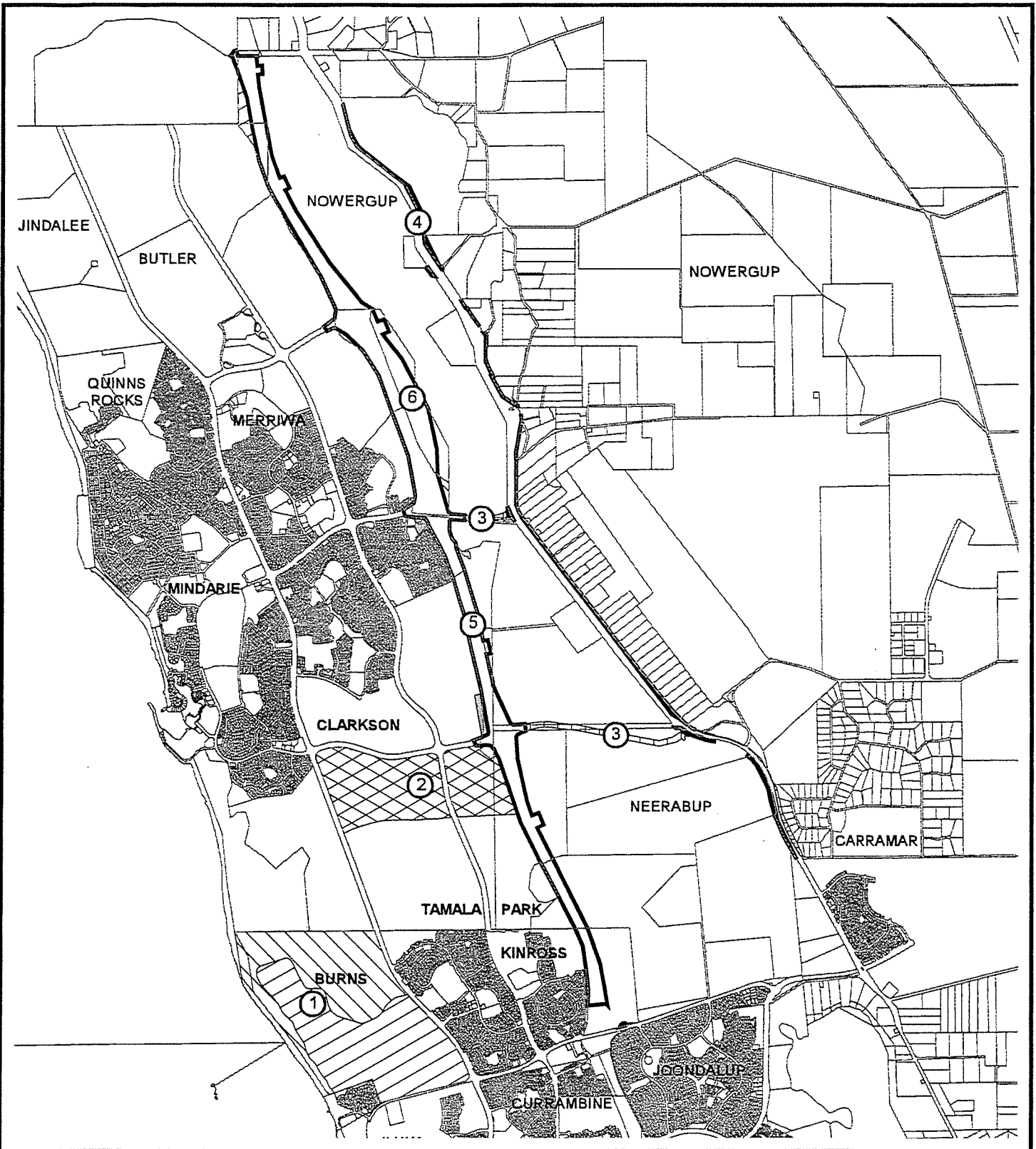
3. Environmental assessment

The EPA is required to report to the Minister for the Environment on the environmental factors relevant to the proposed scheme amendment and the conditions and procedures to which the proposed scheme amendment should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

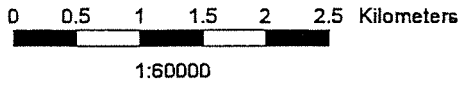
The Environmental Review Instructions identified 78 preliminary environmental factors associated with the 6 proposals. However, it is the EPA's opinion that the following environmental issues, which incorporate a number of environmental factors, require detailed evaluation in this report:

- *Proposal 1 Pt Lot 2 Burns Beach* - impact on regionally significant environmental values;
- *Proposals 2, 5 and 6 - Lot 17 Clarkson, Mitchell Freeway and Rail System and Railcar depot* - impact on the integrity and values of Neerabup National Park and the east-west linkage between Neerabup National Park and the coast;
- *Proposal 3 East-west roads* - impact on the integrity and values of Neerabup National Park; and
- *Proposal 4 Adjustments to Wanneroo Road* - impact on integrity and values of Neerabup National Park and Nowergup Fauna Sanctuary.

The above relevant issues were identified from the EPA's consideration and review of all environmental issues generated from the Environmental Review document and submissions, in conjunction with the proposed scheme amendment characteristics and alternative approvals processes which ensure that the issues will be appropriately managed. On this basis, the EPA considers that other preliminary factors and issues raised in the submissions do not require further evaluation by the EPA in this report.



- ① Proposal Number
- ▭ Cadastral Boundaries
- ▨ Urban Zone
- ▩ Urban Deferred Zone
- ▧ Rural Zone
- ▦ Parks & Recreation Reservation
- ▥ Other Regional Roads Reservation
- ▤ Primary Regional Roads Reservation
- ▣ Railways Reservation



Department of Environmental Protection Western Australia



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MRS Amendment data and Cadastre supplied courtesy of MIP

Figure 1:
Proposals Formally Assessed by the EPA included in proposed major MRS Amendment 992/33 - Clarkson-Butler

3.1 Proposal 1 - "Urban" zoning Pt Lot 2 Burns Beach

Description

The Burns Beach Property Trust, the owners of Pt Lot 2 Burns Beach, have requested the rezoning of approximately 170 ha of Pt Lot 2 from "Rural" to "Urban", with the balance of the lot, 120 ha to be transferred from "Rural" to "Parks and Recreation" reservation.

The Burns Beach Property Trust acquired the subject land as part of the greater area of Lot 2 Burns Beach which is 600 ha in size. A significant portion of the lot east of Marmion Avenue has been rezoned to "Urban" and is currently being developed for residential purposes as the Kinross Estate (WAPC, 1999c).

105 ha of Pt Lot 2 was identified for protection in the System 6 Red Book recommendations by the Department of Conservation and Environment in 1983. The Government has released a Draft Perth's Bushplan report which has been endorsed by the EPA, the WAPC, the National Parks and Nature Conservation Authority (NPNCA) and the Water and Rivers Commission. Draft Perth's Bushplan is aimed at reviewing and replacing the System 6 recommendations. Pt Lot 2 Burns was identified in Draft Perth's Bushplan as part of Site 322, which also extends north into Lot 17 (Government of WA, 1998). Figure 2 shows the proposal in relation to the Department of Conservation and Environment's System 6 Areas M2 and M6 and the Draft Perth's Bushplan boundaries.

Pt Lot 2 was the only recommended site in the metropolitan region to be identified as 'subject to further investigation' and the Environmental Review document noted (WAPC, 1999a):

"The most appropriate mechanism for the protection of this Bushplan Site (No. 322) to be considered through the public comment period in consultation with the land owners (the Burns Beach Property Trust)."

As part of this proposal the land owner (Burns Beach Property Trust), has agreed to cede 120.5 ha of conservation land to the community free of charge (WAPC, 1999a). This land is proposed to be reserved for "Parks and Recreation" as part of this amendment.

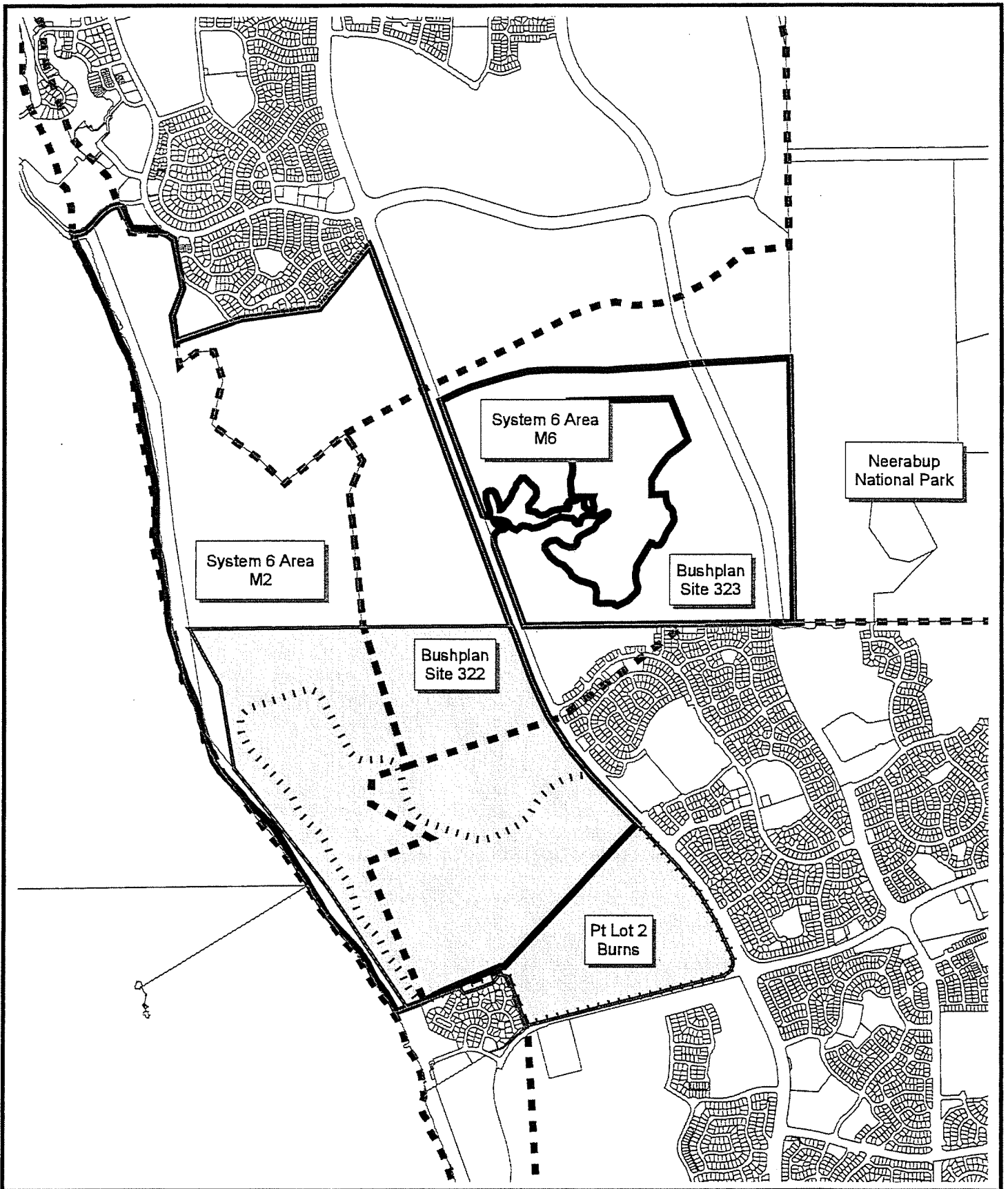
Assessment






The western cell of Lot 2, Burns Beach has been the subject of a previous proposal for urban development. In 1994, the EPA determined that the proposal for urban development of 252 ha of Pt Lot 2 would be formally assessed under Section 38 of the *Environmental Protection Act 1986* at the level of a Public Environmental Review (PER). The EPA completed its assessment of the proposal and released its report and recommendations on 23 January 1998 (EPA 1998).

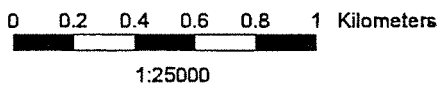
Numerous scientific studies conducted on the subject land have found the site to be of significant conservation value in terms of its vegetation types, geomorphology and habitat values (Trudgen 1990, Keighery 1991, Griffin and Trudgen 1994, Semeniuk et al 1989, Trudgen 1996, McArthur and Bartle 1980, How et al 1996). The conclusions of these studies and others were detailed in the EPA's Bulletin 880.

Taking into account all of the factors and objectives, Bulletin 880 recommended that 55 ha of Pt Lot 2 in the south-west corner was environmentally acceptable for development (see Figure 3). The remainder of the development proposal was considered by the EPA to be unacceptable, on the basis that it:

- would result in the significant loss of vegetation and landform features which represents in a single contiguous block, much of the physical and biological diversity of the Quindalup Dune Systems adjacent to the Spearwood surfaces in the Northern Metropolitan area which has been identified by the DEP as being of regional significance;
- would affect the functioning of the remaining dunal systems;



-  Cadastral Boundaries
-  Proposed Urban Rezoning
-  Superseded System 6 boundaries
-  Draft Bushplan Boundaries (Sites 322 & 323)
-  Pt Lot 2 Burns



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Cadastral, Draft Bushplan Boundaries and Proposed Urban Rezoning data supplied courtesy of MfP

Figure 2:
System 6, Draft Bushplan and proposed Urban boundaries in relation to Pt Lot 2 Burns

- was not consistent with the long standing core area recommended for conservation and regional open space in System 6 recommendations; and
- would compromise the best opportunity to create an east-west bushland corridor from a substantial coastal reserve to Neerabup National Park and beyond to the State Forest/Conservation Reserves on the Gngara Mound.

There were 9 appeals lodged in respect of the EPA's report and recommendations, including a detailed appeal from the Burns Beach Property Trust . The Minister set up an Independent Appeals Committee of selected experts to consider the appeals.

Following their investigations the Appeals Committee reported to the Minister for the Environment that they:

1. agreed with the EPA that a regional park extending from the coast at Burns Beach to Neerabup National Park was a highly desirable objective;
2. concluded that, whilst some of the values on the Quindalup could be repeated north of Burns Beach (subject to land tenure and reservation processes), the interface between the Spearwood and the Quindalup Dune Systems could not;
3. determined that the present degree of disturbance of the south western corner of Pt Lot 2 did not negate its long term conservation value;
4. determined the EPA was justified in determining that the part of Lot 2 comprising Quindalup and Spearwood Dune landforms and vegetation complexes has regional significance.

The Minister determined the appeals and concurred with the EPA that 55 ha in the south-east corner of Pt Lot 2 was environmentally acceptable for development for urban purposes. However, the Minister identified that future opportunities existed for development proposals for the balance of the land to be considered via Section 48A of the Act.

Following the Minister's response to the EPA's assessment the Burns Beach Property Trust sought to modify the proposed zoning for the western cell. An additional 115 ha over and above the 55 ha approved by the Minister is proposed to be rezoned for urban purposes. The loss of vegetation and coastal landforms previously identified by the EPA as being regionally significant are the principal environmental impacts to be considered in this revised proposal.

A comparison of the original proposal considered by the EPA and Proposal 1 in this amendment is summarised in this table.

Table 1 - Comparison of the previous proposal for Urban Development for Pt Lot 2 and the current proposal within MRS Amendment 992/33

Element	Previous proposal	Current MRS Amendment
Total area for development	252 ha	170 ha
Area of Pt Lot 2 to be managed for conservation	38 ha	120 ha
Area to be developed within regionally significant vegetation	197 ha	115 ha
Quindalup/Spearwood interface	Removed all interface (approximately 2 km)	Removes approximately 800m of interface
Dunal systems	160 ha Quindalup dunes removed, 75 ha Spearwood removed, removal of parabolic dune ridge	75 ha Quindalup and 35 ha of Spearwood removed, retention of parabolic dune ridge

The Responsible Authority's Environmental Review has presented an alternative view to that of the EPA about the significance of the vegetation and landforms on Burns Beach on the basis that:

- 340 ha of regionally significant Quindalup Dune and Spearwood Dune vegetation communities will be retained at Mindarie in areas to be reserved for Parks and Recreation under the MRS;
- sustainable areas of the interface between the vegetation complexes will also be retained in the revised proposal;
- the vegetation types removed by the "Urban" zoning are mostly well represented in this proposed Parks and Recreation area in addition to other regional sites;
- the potential for an east-west and north-south fauna corridor to the extent that it can be achieved would also be accommodated; and
- 280 ha of the regionally significant Quindalup Dunes will be retained at Mindarie.

Submissions

Of the 352 submissions on the Clarkson-Butler amendment, 193 submissions were from Burns Beach Property Trust shareholders indicating support for the rezoning of Pt Lot 2. Of the 143 submissions opposing the amendment, 128 submissions were from concerned residents and citizens. The majority of these submissions opposed the rezoning of Pt lot 2 as it ignores the recommendations contained within Bulletin 880 and will destroy Bushplan Site 322. The majority of these submissions called for the protection of all of Pt Lot 2 Burns Beach, including the 55 ha section of land the EPA previously considered acceptable for development. A list of the individuals and organisations that made submissions is included in Appendix 1. The Responsible Authority's response to environmental issues raised in the submissions is included as Appendix 5.

The WA Museum commented on the Environmental Review for this proposal. The main conclusions were that:

- the comparison of the species richness of Burns Beach to other sites is highly questionable given that the other sites have been sampled over a much longer time frame over several seasons;
- the retention of the largest area of unfragmented bushland is the most parsimonious outcome for faunal populations and species in the area; and
- it should not be assumed that because large areas of 'similar habitat' remain that coastal dune species remain secure. Replication of large areas of Quindalup and Cottesloe habitats are important to the long term survival of species in the bushlands of the Perth area which are already suffering the impacts of fragmentation and isolation.

Conclusions

The issue being considered in relation to this proposal is the impact on regionally significant environmental values. The environmental factors relevant to this proposal are listed below.

Issue	Relevant environmental factors
Impact on regionally significant environmental values	Vegetation System 6 Terrestrial Fauna Landform Dunes

The EPA considers that the additional information provided by the Responsible Authority has not demonstrated that the significant environmental values of this area would be protected in relation to vegetation, fauna and landforms. The unique values present within Pt Lot 2 Burns cannot be replicated elsewhere and will be significantly impacted by the proposal. By removing a large section of the currently intact dunal system, the current proposal will destroy the transitional dunal system, so that the intertidal zone with associate young Quindalup Dunes will be separated from the older Quindalup Dunes and the Spearwood Dunes.

It is the EPA's opinion that the additional 115 ha proposed for "Urban", beyond the 55 ha identified to be acceptable by the EPA in Bulletin 880, should not be implemented. The 55 ha of land that was previously identified by the EPA as being acceptable for development remains the EPA position. The EPA appreciates that if all of the land proposed to "Urban" zoning is not approved, the owners of Pt Lot 2 would not agree to cede the 120 ha of land to "Parks and Recreation". This land would therefore presumably remain as "Rural" zoned land. This may not provide for adequate protection and management of the significant environmental values present on the site. The EPA therefore advises the Responsible Authority and the Local Government that the area of Pt Lot 2, outside of the 55 ha considered appropriate for development, should be managed to protect its environmental values.

In summary, except for the 55 ha as shown in Figure 3 entitled 'Area considered acceptable for development', the EPA holds the view that the proposed rezoning of Pt Lot 2 Burns to "Urban" as set out in Figure 2 as 'Proposed Urban rezoning' should not proceed.

3.2 Proposals 2, 5 and 6 - "Urban Deferred" zoning Lot 17 Clarkson, the Alignment for Mitchell Freeway and Northern Suburbs Rail System, and the Reservation for Railcar depot

Description

Proposal 5 reserves land for the northern extension of the Mitchell Freeway including an extension of the Northern Suburbs Rail system for "Primary Regional Roads" and "Railways" from Burns Beach Road to Romeo Road through and adjacent to Neerabup National Park. The proposal also includes small sections of land surplus to Freeway requirements being transferred from "Rural" zone and "Parks and Recreation" reservation to "Urban" zone. This proposal will complete the Freeway reserve for the MRS in the North West Corridor.

Proposal 6 relates to the reservation for a Railcar stowage and servicing depot which is more or less a widening of the corridor for Proposal 5 between Hester Avenue and Lukin Drive, at Nowergup. The Railcar depot is proposed to perform two main functions; to maintain the railcar fleet in a safe, clean and efficient condition and to provide stowage for that part of the fleet not required during off-peak hours (WAPC 1999a). The combination of Proposals 5 and 6 have been referred to in the Environmental Review documents as the 'Mitchell Freeway Transportation Corridor'.

Proposal 2 includes the rezoning of the northern 135 ha portion of Lot 17 Marmion Ave, Clarkson, from "Rural" zone to "Urban Deferred" zone. The principal environmental issue in this proposal is the 10 ha portion of Neerabup National Park that is proposed to be rezoned to "Urban Deferred" zone. This 10 ha section will be severed from the Park by the Mitchell Freeway Transportation Corridor. Therefore the outcome for Proposal 2 is also, to some extent, dependent on the outcome of Proposal 5 (see Figure 6).

The Mitchell Freeway Transportation Corridor crosses Neerabup National Park for 2.9 km, separating about 73 ha of the south west corner from the rest of Neerabup National Park (which includes the 10 ha portion of the Park proposed for rezoning in Proposal 2). North of Lukin Drive it again enters the Neerabup National Park, traversing the western margin for a further 3 kilometres. Overall the proposals will excise 132 ha from Neerabup National Park.

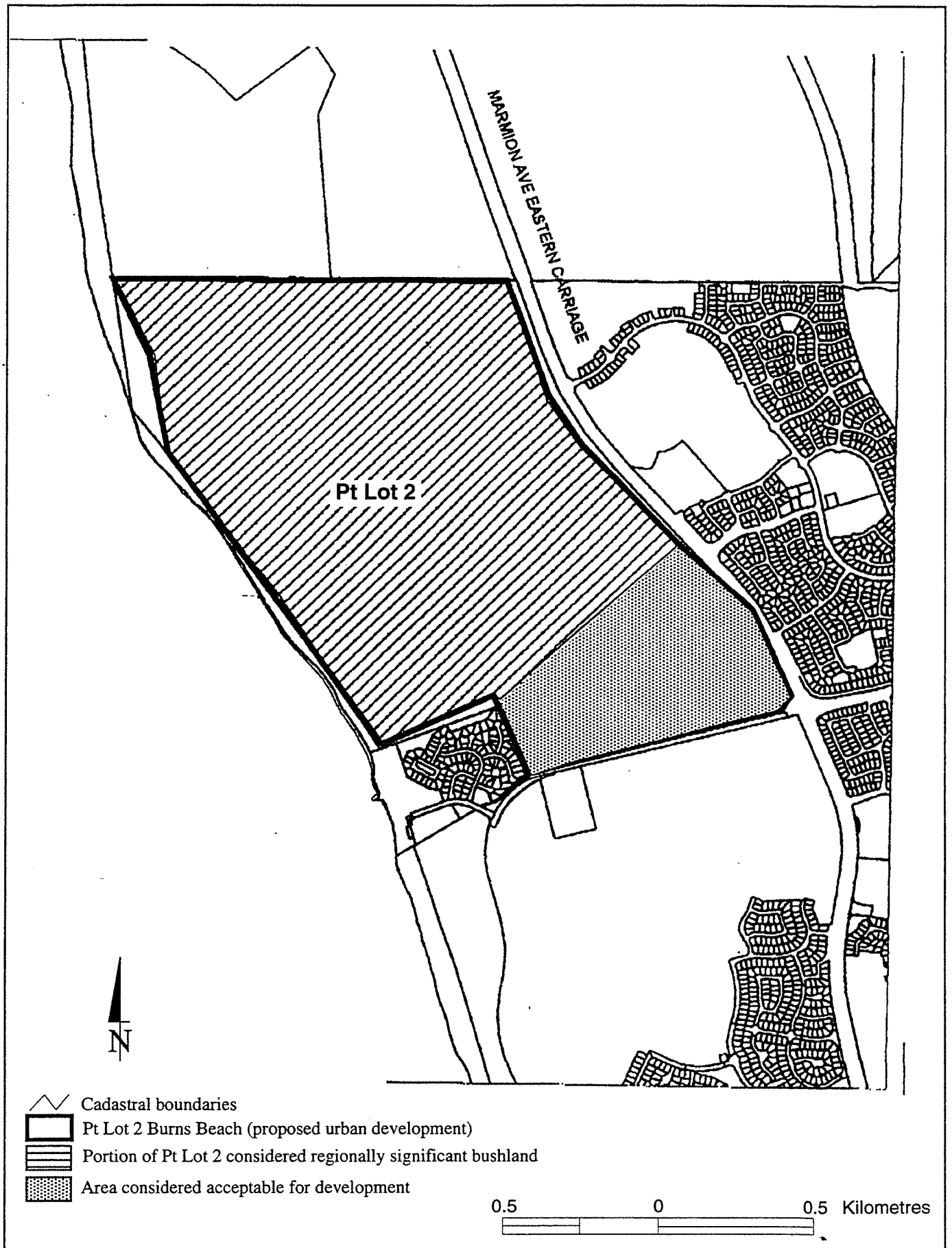


Figure 3. Regionally significant bushland at Part Lot 2 Western Cell Burns Beach.

Neerabup National Park, including the amendment area, is recognised as containing regionally significant vegetation, recommended for protection in the System 6 Red Book (DCE, 1983) and Draft Perth's Bushplan (Government of WA, 1998). All three proposals impact on the western margin of Neerabup National Park. The EPA considers that the impacts of the three proposals can be assessed together in this Section, given that the outcome for the proposals are dependent on each other. Although the EPA is reporting on the three proposals as one entity in this Section, the EPA has developed separate conditions for each proposal which are described in Section 4 and presented in Appendix 4.

Figure 4 shows the location of Proposals 2, 3, 5 and 6 (as the Mitchell Freeway Transportation Corridor) in relation to the Draft Perth Bushplan Sites and the boundaries of Neerabup National Park.

Background

A comprehensive background to the proposals including past EPA positions and important statements regarding the rationalisation of Neerabup National Park is included in this section to provide context to the EPA's decision in relation to these proposals.

In 1989 the EPA provided advice to the (then) Department of Planning and Urban Development about the extension to Mitchell Freeway through Neerabup National Park as part of the Clarkson-Butler Draft Planning Strategy:

"The EPA has decided that the provision of an extension to Mitchell Freeway through Neerabup National Park is not acceptable. The principle of an adjustment to the park boundaries or relocation of the freeway reserve is likely to be acceptable, provided there is not a net loss in conservation values. An exchange of some National Park land is prospective, provided it meets the requirements of the National Parks and Nature Conservation Authority, and subject to the Environmental Review process."

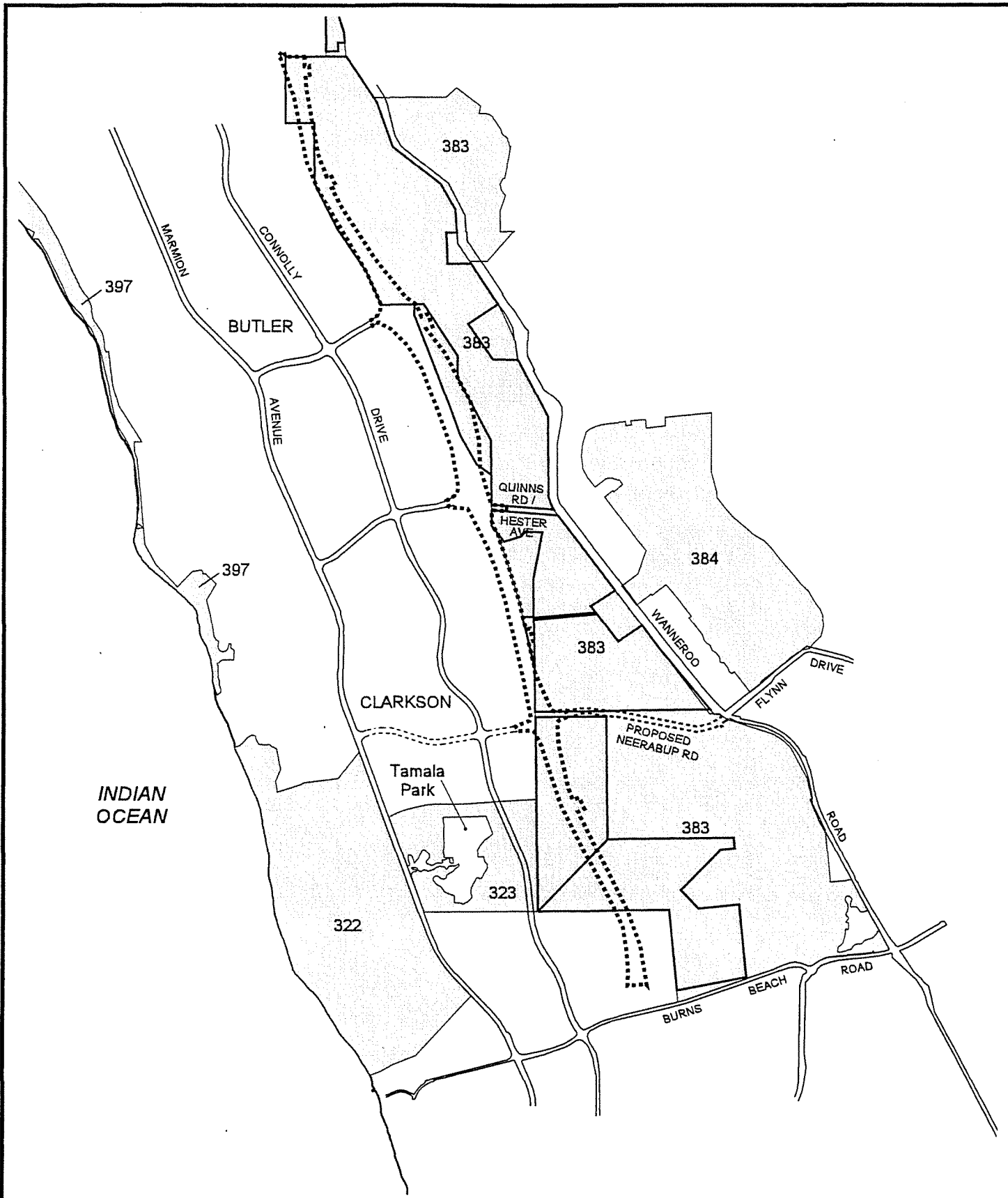
The proposed rationalisation of areas to be included and withdrawn from Neerabup National Park for the proposed freeway alignment was later considered by Government in 1989. The Government approved the rationalisation but noted that a Public Environmental Review of the Park rationalisation proposal by the EPA was needed.

The EPA in 1989 decided to formally assess a proposal for residential rezoning and development of Burns Beach Stage 2, which is the area to the direct west of the southern section of proposed Transportation Corridor. In 1990 the EPA provided the following relevant advice in its assessment and recommendations on Burns Beach Stage 2:

"The EPA considered that an issue which must be resolved before the Authority could finalise its assessment of Stage 2 of the Burns Beach development proposal was the transport requirements of the NW corridor, in particular the alignment of the Mitchell Freeway and rapid transit system in relation to Neerabup National Park."

Government has subsequently decided that planning and environmental assessment associated with the proposed rationalisation of the national park boundary should be separate to the Clarkson-Butler urban development proposals, including the Burns Beach Estate. In regard to rationalisation of the national park boundary, an implementation process has been agreed to which will include a public environmental review, MRS Amendment, and a Reserves and Land Revestment Bill. If implementation of the National Park rationalisation does not proceed, then the transport system (freeway and rail) will not be permitted to encroach on the National Park." (EPA 1990)

In December 1993 the EPA released Bulletin 729 as its Informal Review with Public Advice on Metropolitan Region Scheme Amendment No. 932/33 which related to proposals in the Alkimos-Eglinton area (to the north of Clarkson-Butler). The proposed freeway reservation in Amendment No. 932/33 clearly anticipated the extension of the Freeway alignment southwards through Neerabup National Park. The EPA stated in its report:








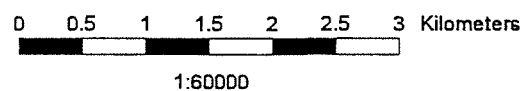
-  Proposed Mitchell Freeway Transportation Corridor
-  Proposed Neerabup Rd & Hester Ave
-  Arterial Roads
-  Current Neerabup National Park boundary
-  Draft Bushplan Sites

Figure 4:
Draft Bushplan Sites in relation
to Proposals 2, 3, 5 & 6



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 Protection Western Australia



Projection: Australian Map Grid
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 any error or omission.
 Arterial Roads derived from
 Cadastre, and Proposed roads
 data supplied courtesy of MFP

“The Authority is not opposed to future land exchange arrangements for the Mitchell Freeway, provided that land of equal conservation value is obtained to the satisfaction of the Department of Conservation and Land Management, the National Parks and Nature Conservation Authority and the EPA.

Accordingly, the proposed Mitchell Freeway alignment, south of Romeo Road (through Neerabup National Park), should be referred to the Authority for the assessment when more detailed plans are produced.”(EPA 1993)

Assessment

Impacts on Neerabup National Park

The proposed Mitchell Freeway Transportation Corridor involves very significant disturbance to and excision from Neerabup National Park. 132 ha of vegetation will be excised and a further 73 ha will be isolated from the remainder of the Park. The potential impacts from these proposals include:

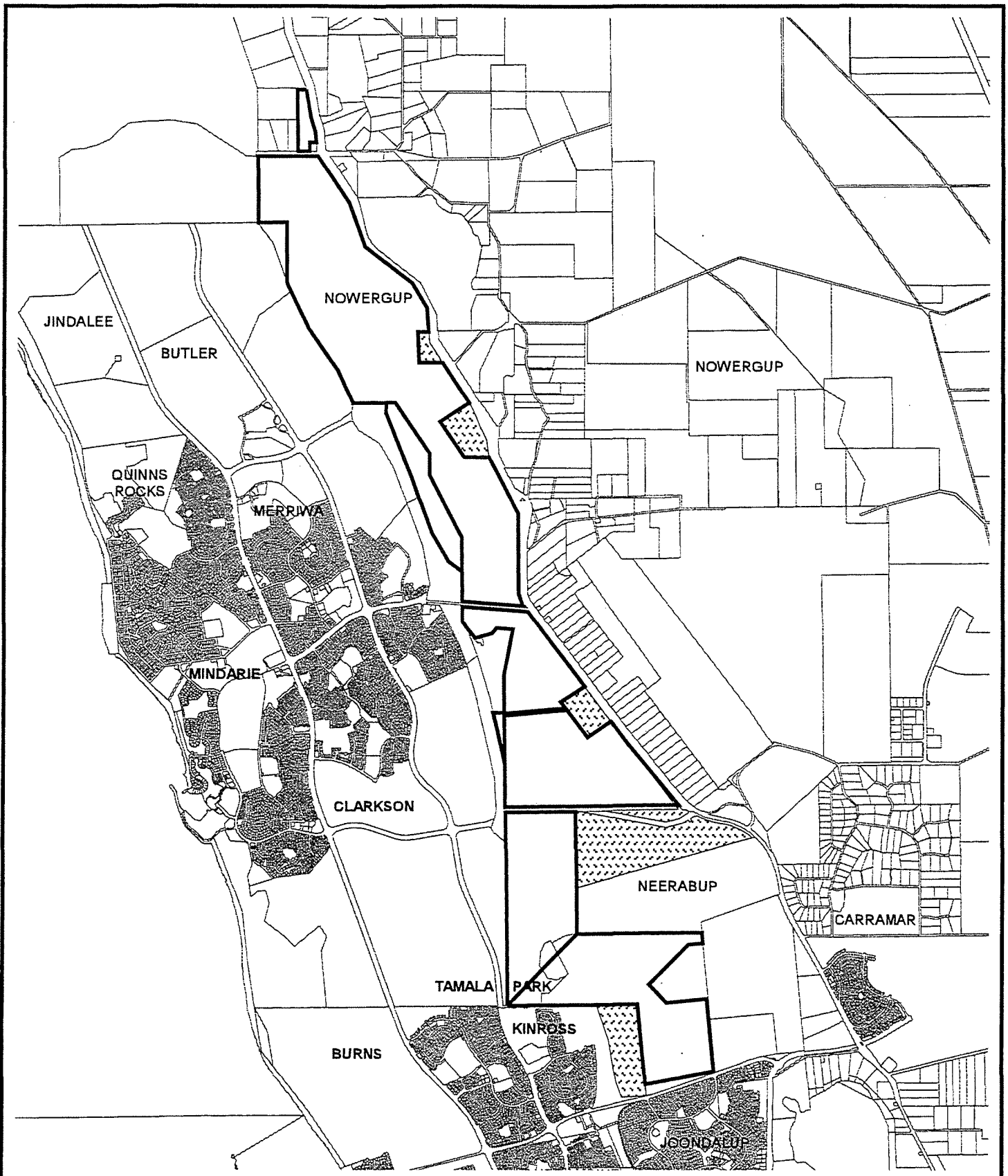
- Loss of regionally and locally significant vegetation;
- Vegetation and habitat fragmentation; and
- Increased susceptibility of Neerabup National Park and Bushplan Site 323 (to the west) to indirect impacts such as fire, weed invasion, and dieback.

Severance of both the east-west linkages between the remnant vegetation in coastal regions and that present within Neerabup National Park is also a significant issue but is unavoidable if the extensions to the freeway and rail corridor proceed.

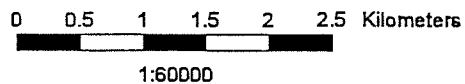
In assessing the excisions from Neerabup National Park the EPA has acknowledged the Responsible Authority’s efforts in securing land for conservation purposes to achieve an overall increase in the size and improve the shape of Neerabup National Park. The current Neerabup National Park boundary is shown in Figure 4. Loss of portions of Neerabup National Park will be offset by the reservation for “Parks and Recreation” of approximately 190 ha of private land and existing reserves generally situated between the proposed Mitchell Freeway and Wanneroo Road which are shown in Figure 5. A further 382 ha of private land adjacent to Neerabup National Park has already been reserved in previous MRS Amendments. If the overall 140 ha proposed to be excised as part of this MRS Amendment is deducted, the net increase in the “Parks and Recreation” reservation adjacent to the Park would be 432 ha (WAPC 1999a). If the 63 ha that is being separated from the south-west corner of the Park by the Transportation Corridor is subtracted, the net increase in the area of the Park is still some 369 ha.

Comments and information from the National Parks and Nature Conservation Authority (NPNCA) as the vestee of Neerabup National Park regarding the potential impacts on the Park were requested. In particular the EPA sought advice on:

1. previous NPNCA agreements or decisions regarding the proposals impacting on Neerabup National Park;
2. an overall assessment of the conservation values of areas being lost and gained, in particular:
 - a) details of the vegetation types of each of the areas being proposed to be added to Neerabup National Park;
 - b) a break up of how much of each vegetation type is to be lost and gained following implementation of the amendment;
 - c) details of the potential impacts on the long term viability of fauna populations;
 - d) the potential management implications of the proposals; and
3. any comments on the proposed management measures put forward by the Western Australian Planning Commission.



-  Current Neerabup National Park boundary
-  Neerabup National Park Proposed Additions
-  Cadastral Boundaries

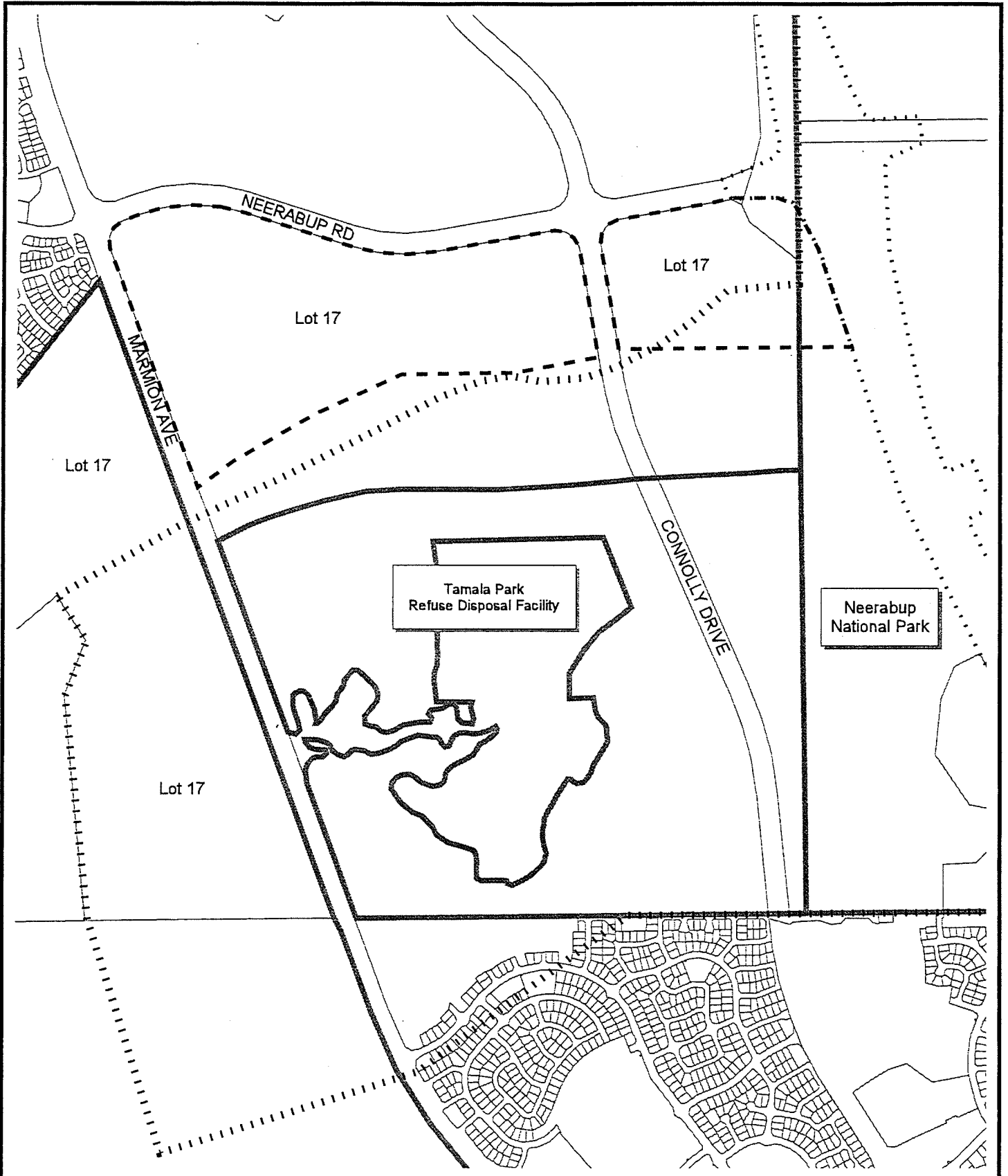







Department of Environmental Protection Western Australia



Projection: Australian Map Grid
 This map has been produced using various data from other agencies. No responsibility is accepted for any error or omission.
 Current NNP boundary data supplied courtesy of CALM
 Proposed additions to NNP boundary and Cadastre supplied courtesy of MIP

Figure 5:
Current Neerabup National Park boundary and proposed additions as part of this amendment



-  Proposal 2 Area
-  Proposed Mitchell Freeway Transportation Corridor
-  System 6 M6
-  Bushplan Boundary
-  Cadastral Boundaries

0 100 200 300 400 500 Meters



1:15000

Department of Environmental
Protection Western Australia



Projection: Australian Map Grid

This map has been produced using various data from other agencies. No responsibility is accepted for any error or omission.

Bushplan Boundary, Cadastre and Proposed Transportation Corridor supplied courtesy of MIP

Figure 6:
Areas recommended for protection under System 6 and Bushplan in relation to Proposal 2

A copy of the NPNCA response is included in Appendix 2. In summary the NPNCA:

- has agreed to excisions from the south western corner of the Neerabup National Park, an area which would be isolated by the transport corridor, in exchange for the uncleared portion of lots 12 and 14 located between the Park's south western boundary and Wanneroo Road;
- have supported the MRS Amendment as proposed;
- considers that there are issues in relation to fauna movement and are uncertain as to the best outcome in relation to fauna underpasses or alternatives including the use of overpasses;
- have verified that CALM do not have access to definitive information regarding vegetation values of the areas impacted. However, CALM has relied upon earlier work by Keighery BJ, Keighery GJ and Gibson N and advice that the proposed additions to the south-east are a significant benefit to the Park in terms of vegetation and as a wider management corridor; and
- as far as management issues are concerned, apart from fauna crossings, the NPNCA considers that the major issues to be resolved are to ensure that the additions to the Park are finalised and that future services crossing the Park are consolidated into the two east-west road carriageways as proposed.

Buffer from Tamala Park Regional Landfill

Proposal 2 (Lot 17 Clarkson) is partly affected by operational buffers associated with the Tamala Park Refuse Disposal Facility site and therefore portions of the land are constrained for future development (see Figure 6). It is proposed in the Environmental Review that a 500m buffer be provided from the landfill site which will not be developed until the refuse disposal facility is closed or an odour study is undertaken. It is not possible with the limited information available in the Environmental Review to say whether the 500m buffer will be adequate either currently or in the future.

The Department of Environmental Protection's (DEP's) adopted policy for Criteria for Landfill Management recommends that there should be no residential subdivisions within 500m of the active face of any putrescible filling area. The policy does not allow for this buffer to be varied in relation to the size or amount of landfill entering the site. Given that Tamala Park is one of the largest landfills in the metropolitan area, 500m is considered to be an absolute minimum buffer distance. The policy does state however that reductions to buffer zones may be considered where operators can demonstrate that environmental standards will not be compromised.

A standard odour study using dynamic olfactometry would be suitable for considering an appropriate buffer distance for odour impacts. The issues of noise, landfill gas and dust could also be addressed through appropriate studies to support such an application. A draft condition is recommended (see Appendix 4) to confirm the need for a 500m buffer from any existing or proposed filling areas with the flexibility to reduce the buffer if warranted.

Railcar depot

When MRS Amendment 992/33 was initiated in 1997, a Railways reservation for a Railcar stowage and servicing depot was proposed for the western side of the Freeway alignment on a portion of Neerabup National Park between Neerabup Road and Hester Avenue, at Tamala Park (WAPC 1999a). This area was considered to have significant environmental value in terms of the excellent condition of the vegetation and maintaining a vegetated link from Neerabup National Park and the coastal reserves.

The DEP and the Department of Conservation and Land Management (CALM) negotiated for the Railcar depot to be relocated to its current proposed position, between Hester Avenue and Lukin Drive, on former grazing land that was added to the Park in 1981. If dieback and weed

control is adequate, the environmental impact on Neerabup National Park should be kept to a minimum.

At present the flora survey work undertaken for Proposal 6, (as well as for Proposals 2 and 5), while sufficient to identify vegetation units present, was not thorough enough to identify possible populations of DRF or priority taxa. It is recommended that further survey work within and adjacent to the proposed amendment areas should be undertaken as part of an overall Vegetation and Fauna Management Plan to identify if there is any Declared Rare Flora (DRF) or priority taxa present. These species should be protected pursuant to the provisions of the Wildlife Conservation Act 1950.

Submissions

There were a number of public submissions objecting to the alignment of the road and rail proposals through Neerabup National Park. Several of the submitters were critical of the planning system which has sought to cut through a National Park and considered any excisions from the Park environmentally unacceptable. It was also raised in the submissions that the Park and adjacent bushland recognised in Bushplan has over time been subject to many incursions and what remains should be protected.

Conclusion

The issue being considered in relation to these proposals is the impact on the integrity and values of Neerabup National Park and the east-west linkages between Neerabup National Park and the coast. The environmental factors relevant to this proposal are listed below.

Proposal	Issue	Relevant environmental factors
Lot 17 Clarkson	Impact on the integrity and values of Neerabup National Park and the east-west linkages between Neerabup National Park and the coast. Impact on the amenity of future residents by the Tamala Park Landfill facility.	Vegetation System 6 Terrestrial Fauna Odour
Mitchell Freeway and Rail system	Impact on the integrity and values of Neerabup National Park and the east-west linkages between Neerabup National Park and the coast.	Vegetation System 6 Terrestrial Fauna
Railcar Depot	Impact on the integrity and values of Neerabup National Park and the east-west linkages between Neerabup National Park and the coast.	Vegetation System 6 Terrestrial Fauna

The EPA considers that the severance of both the east-west linkages between the remnant vegetation in coastal regions and that present within Neerabup National Park is unavoidable if the extensions to the freeway and rail corridor proceed. In view of:

- the NPNCA's advice that the proposed amendment will not be detrimental to the environmental values present within the Neerabup National Park; and
- the proposed reservation of additional land being included in the Park;

it is the EPA's opinion that Proposals 2, 5 and 6, if implemented, will not significantly impact on the maintenance of the integrity and values of Neerabup National Park, provided that the conditions contained in Appendix 4 are incorporated into the Metropolitan Region Scheme.

The EPA considers that the proposed additions into Neerabup National Park are critical to the acceptability of these proposals. The EPA reiterates its position that should the rationalisation of Neerabup National Park's boundary not proceed as described in the Responsible Authority's Environmental Review documents, then the excision of land from the Park for the transport system (freeway and rail) should not proceed.

3.3 Proposal 3 Reservation of the two east-west roads

Description

Proposal 3 is the reservation of two proposed east-west district distributor roads between the Mitchell Freeway and Wanneroo Road for Other Regional Roads.

Proposal 3 would require the excision of less than 2 ha from the existing Neerabup National Park for the extension of Neerabup Road and Hester Avenue through to Wanneroo Rd (see Figure 4). The remaining land for the proposed roads is Unallocated Crown Land and freehold land (Lot 14). It is intended that the balance of Lot 14, approximately 102 ha, would be added to Neerabup National Park (WAPC, 1999a).

Assessment

The excision of the areas of the National Park and the resultant loss of remnant bushland and fauna habitat is the obvious environmental issue associated with the construction of the proposed roads. However, another significant issue is the impact of habitat fragmentation and barriers to fauna movement which may result in the loss of fauna populations.

The Ministry for Planning undertook investigations for the planning of three roads through Neerabup National Park in 1996 and 1997. GHD (1996) and Ecologia consultants (1996 and 1997) were contracted examine the proposed roads, including an assessment of all environmental factors, and to provide preliminary conceptual design and land requirement plans.

Ecologia prepared two biological assessments on the three proposed roads (including Lukin Drive which is not part of this MRS Amendment). Some of the conclusions reached were that (Ecologia, 1997):

- Neerabup National Park is already divided in two by the existing Quinns Road (Hester Avenue alignment) which acts as a fauna barrier between the north and south sides of the Park. The areas north and south of Quinns Road area are approximately 480 ha and 630 ha respectively;
- The construction of Neerabup Road will divide the Park into three sections. Species with larger home ranges will tend to be disadvantaged to a higher degree by habitat fragmentation and reduction in the area of suitable habitat;
- Based on ecological/conservation factors the most desirable strategy would be to construct a single extension along Hester Avenue. The impact to this area is likely to be less than elsewhere for a number of reasons. Firstly, there is an existing bitumen two lane road which will only require widening to provide a four-lane carriageway;
- In the case of Neerabup Road, an entirely new road would need to be constructed along the western half. Consequently the impact will necessarily be greater;
- Impact to the Eucalypt woodlands surrounding the proposed Neerabup Road corridor is also seen as a less desirable option. Whilst most of the vegetation appears broadly distributed locally, the corridor skirts the southern edge of a small area of Eucalyptus calophylla/ Acacia rostellifera which appears to be poorly distributed;

- Construction of Neerabup Road would divide the Banksia Eucalypt Woodland habitat, which is considered the most utilised by kangaroos, into two areas. This habitat, already confined to a relatively small area, would be seriously affected by the segregation created by the construction of the road. Fauna movement, and therefore genetic flow, between these areas would be seriously impeded for non-aerial species. It is likely that impact to macropods such as the Western Grey Kangaroo and Brush-Tailed Wallaby due to compartmentalisation of habitat will be greatest with this route;
- The proposed route will also reduce the amenity of the proposed adjacent portion of Yaberoo Budjara Heritage Trail and the 10th Light Horse Memorial Trail; and
- The fencing proposed to be erected, whilst reducing potential roadkills, will prevent the escape of non-aerial fauna in the event of a bushfire. There is currently no evidence to suggest whether the fauna underpasses are utilised by fauna, particularly larger species such as kangaroos.

The Ecologia study (1997) found that introduced mammals have become well established in the area, and that native animals are already currently under pressure within the project area from factors such as predation by and competition with introduced species, disease, habitat loss and degradation, increased frequency of burning and increased road deaths. By further fragmenting the Park, increasing edge effects and reducing the population size the fragments can sustain, the proposal will increase the current pressure on these species (Ecologia, 1997).

One of the conclusions made in the GHD report prepared in 1996 for the Ministry for Planning was that the primary impact on the Park is the breaking up of fauna habitats into smaller semi-isolated units. The size of the units was considered to be adequate to maintain viable populations, provided that the animals can move freely between the units (GHD 1996). However, the effectiveness of the fauna underpasses is unknown. It is considered that the measures would not entirely mitigate the impacts, and the viability of the fauna populations in the Park would be likely to ultimately be reduced (GHD 1996)

The Environmental Review identifies a Kwinana Freeway fauna underpass study undertaken by Ecologia (1995) is one of the few studies addressing the utilisation of these structures by fauna. The Ecologia study indicated that underpass entrances were frequented by fauna, however, few animals proceeded along the underpass for more than one or two metres from the tunnel entrance. Four fauna species were found to use the underpasses, with the feral cat being the only species which used the underpass regularly (Ecologia 1995).

As stated earlier in Section 3.2, the NPNCA have supported the proposal but considers that there are issues in relation to fauna movement. The NPNCA have stated that they would support the need for further research into the alternatives such as fauna overpasses and request that future services crossing the Park are consolidated into the two east west road carriages as proposed.

Submissions

A number of public submissions were in opposition to Neerabup Road in particular. A number of submissions identified that Neerabup Road is unacceptable as it proposes to cut across Neerabup National Park at its widest part and is not required. Joondalup, which lies west of Joondalup Lake, manages very well with a road north and south of the lake.

Comment on this Proposal was received from the WA Museum. In summary the Museum concluded that:

- fragmentation of Neerabup National Park will have long-term consequences deleterious to the biodiversity of the Park. Smaller areas will retain smaller populations and generally fewer species; and
- the usefulness of faunal underpasses to faunal movements has not been documented in the Perth area.

Conclusions

The issue being considered in relation to this proposal is the impact on the integrity and values of Neerabup National Park. The environmental factors relevant to this proposal are listed below.

Issue	Relevant environmental factors
Impact on the integrity and values of Neerabup National Park	Vegetation System 6 Terrestrial Fauna (deferred)

On the basis of the NPNCA advice the EPA has resolved to support the Neerabup Road rezoning provided that the design and construction of the road is referred to the EPA for assessment under Section 38 of the Environmental Protection Act. The referral under Section 38 will allow the EPA to more conclusively assess the potential impacts of the road on fauna movement and park management, which are still significant concerns. Although the EPA has considered the impacts of the proposal on Terrestrial fauna in a preliminary sense, the EPA has determined through its assessment that the factor should be “Deferred” so that the impact of the proposal on fauna populations can be assessed through the Section 38 assessment.

The EPA expects that the design and construction of Neerabup Road will have to be of an exceptional standard, given its location within a National Park, and particularly address the issue of fauna movement. This could include tunnelling of the road for large sections of the alignment to create fauna overpasses. Alternatives for facilitating the movement of fauna across the alignments needs to be thoroughly investigated.

In addition it is expected that the Responsible Authority should also investigate into providing assistance to the NPNCA to reduce the existing pressures, such as predation by and competition with introduced species, disease and increased road deaths, on fauna populations within Neerabup National Park. For example, the Responsible Authority could contribute funding towards the costs of baiting for feral animals within the Park or fencing of existing perimeter roads.

It should also be noted that the EPA supports the NPNCA position that all future services and infrastructure crossing the Park must be consolidated into the two east-west road carriages as proposed. Any further proposals for crossings of the Park will not be considered to be environmentally acceptable.

It is the EPA’s opinion that the proposed scheme amendment, to provide for two east-west road reserves is acceptable, provided that the conditions contained in Appendix 4 are incorporated into the Metropolitan Region Scheme, but the actual construction of Neerabup Road should be referred to the EPA for assessment under Section 38 of the Environmental Protection Act. The factor of Terrestrial fauna has been deferred so that the impacts of a road through the Neerabup road reserve can be assessed at a later date.

3.4 Proposal 4 Adjustments to Wanneroo Road reservation

Description

The current MRS reservation for Wanneroo Road provides for the long term widening to a road of 4-lane divided road standard. The purpose of Proposal 4 is to rationalise and reduce the current reservation. The proposed reservation will still allow for future upgrading of Wanneroo Road to a 4-lane divided standard.

The proposed adjustments to Wanneroo Road's boundaries occur between Carramar Road and the northern boundary of the Nowergup Lake Fauna Sanctuary (see Figure 1). Neerabup National Park abuts Wanneroo Road on the western side. The potential impacts on the Fauna Sanctuary and Neerabup National Park are the principal concerns with this proposal.

Assessment

The adjustments include the excision of 0.68 hectares from the Neerabup National Park and 1.7 hectares of Nowergup Lake Fauna Sanctuary. 2.07 Ha of the Neerabup National Park previously required for the road widening would no longer be required. Impacts include:

- Loss of regionally significant vegetation;
- Increased fragmentation of the vegetation in Neerabup National Park and Nowergup Lake Fauna Sanctuary;
- Alterations to surface hydrology;
- Increased susceptibility of adjacent vegetation to indirect impacts such as weed invasion and dieback.

The EPA's main concern with the Environmental Review was the method of determining conservation status of the vegetation. A spring survey should have been undertaken to allow for collection of annual and ephemeral species. The current work is therefore inadequate to identify the presence of species of conservation significance. A more thorough spring survey needs to be undertaken for Declared Rare and Priority Flora, especially within the area to be removed from the Nowergup Lake Fauna Sanctuary, an area of vegetation in excellent condition. The moderately dense shrub layer present here may have reduced the detection on smaller species, including *Hibbertia spicata* (Priority 3) a species easily confused with *Hibbertia hypericoides*.

The EPA is also concerned that there were no fauna surveys conducted of the areas to be impacted, particularly given the potential impacts on Nowergup Lake Fauna Sanctuary. The Environmental Review does, however, propose that a fauna survey will be undertaken for Schedule and Priority Fauna prior to any site works to the satisfaction of CALM.

Submissions

There were some comments on Proposal 4 received during the public review period. The majority of the concerns were that the widening of Wanneroo Road will affect remnant vegetation within the road reserve and associated environmental values. It was suggested that the vegetation being removed is significant as it contains significant stands of trees and acts as a buffer or extension to Neerabup National Park and the Nowergup Fauna Sanctuary.

Conclusions

The issue being considered in relation to this proposal is the impact on integrity and values of Neerabup National Park and Nowergup Lake Fauna Sanctuary. The environmental factors relevant to this proposal are listed below.

Issue	Relevant environmental factors
Impact on the integrity and values of Neerabup National Park and Nowergup Lake Fauna Sanctuary	Vegetation System 6 Terrestrial Fauna

The EPA has determined that Declared Rare and Priority Flora and fauna surveys still need to be undertaken to identify the presence of any species of conservation significance. These species should be protected pursuant to the provisions of the Wildlife Conservation Act 1950.

The EPA considers that the proposed alterations to the Wanneroo Road alignment can be managed to avoid significant adverse impacts on both Neerabup National Park and Nowergup Fauna Sanctuary.

It is the EPA's opinion that the proposed scheme amendment, can be implemented, provided that the conditions contained in Appendix 4 are incorporated into the Metropolitan Region Scheme.

4. Conditions

Section 48D of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the conditions to which the proposed scheme amendment should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions, the EPA's preferred course of action is to have the Responsible Authority provide management measures and/or scheme provisions to ameliorate the impacts on the environment. However, these proposed provisions are not always sufficient to ensure that the EPA's objectives will be met.

Having considered the Responsible Authority's environmental management measures, scheme provisions and the information provided in this report, the EPA has developed a set of conditions which are consistent with but replace those environmental management measures in the proposed scheme amendment documentation, if the proposed scheme amendment is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) Environmental Management Plans including:
 - Vegetation and Fauna Management Plans for Proposals 2, 3, 4, 5, and 6;
 - Construction Management Plans for Proposals 3, 4, 5 and 6;
 - Noise and Vibration Management Plan for Proposals 5 and 6;
- (b) Buffer requirements from Tamala Park Landfill for Proposal 2;
- (c) Stygofauna and Troglitic Fauna Management for Proposal 2;
- (d) Assessment of Karst landforms for Proposal 2; and
- (e) Referral of the design and construction of Proposal 3 to the Environmental Protection Authority.

It should be noted that other regulatory mechanisms relevant to the proposed scheme amendment are:

- Lifting of the "Urban Deferred" zoning for Proposal 2 (Lot 17 Clarkson);

- Subsequent rezonings and reservations under Local Authority's Town Planning Schemes; and
- Subdivision and development approval processes for Proposal 1 (Pt Lot 2 Burns).

5. Conclusions

The EPA has concluded that MRS Amendment No. 992/33 Clarkson-Butler, excluding the rezoning of 115 ha of the south-western portion of the 'western cell' of Pt Lot 2 Burns from "Rural" zone to "Urban" shown in Attachment 1 of Appendix 4, can be implemented to meet the EPA's objectives provided the conditions recommended in Section 4 and set out in Appendix 3 are imposed and enforced.

6. Recommendations

Section 48D of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the proposed scheme amendment and on the conditions and procedures to which the proposed scheme amendment should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

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

1. That the Minister notes that the proposed scheme amendment being assessed comprises of six proposals for rezoning and reservation in the north-west corridor of the metropolitan region;
2. That the Minister considers the assessment as set out in Section 3;
3. That the Minister notes that the EPA has concluded that Proposal 1, Pt Lot 2 Burns Beach, excluding the rezoning of 115 ha of the south-western portion from "Rural" zone to "Urban" shown in Appendix 4, could be implemented provided there is satisfactory implementation by the Responsible Authority of the recommended conditions set out in Section 4.
4. That the Minister notes that the EPA has concluded that Proposal 2, Lot 17 Clarkson, could be implemented provided there is satisfactory implementation by the Responsible Authority of the recommended conditions set out in Section 4.
5. That the Minister notes that the EPA has concluded that Proposal 3, East-west roads, could be implemented provided there is satisfactory implementation by the Responsible Authority of the recommended conditions set out in Section 4, including a referral of the design and construction of the road to the EPA for assessment under Section 38 of the Environmental Protection Act.
6. That the Minister notes that the EPA has concluded that Proposal 4, Adjustments to Wanneroo Road, could be implemented provided there is satisfactory implementation by the Responsible Authority of the recommended conditions set out in Section 4.
7. That the Minister notes that the EPA has concluded that Proposal 5, Mitchell Freeway and Rail System, could be implemented provided there is satisfactory implementation by the Responsible Authority of the recommended conditions set out in Section 4.
8. That the Minister notes that the EPA has concluded that Proposal 6, Railcar depot, could be implemented provided there is satisfactory implementation by the Responsible Authority of the recommended conditions set out in Section 4.
9. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Appendix 1

List of submitters

Organisations and Community Groups:

Aboriginal Affairs Department
Department of Land Administration
Heat the World Inc
Department of Transport
Turlock Nominees P/L
City-Sea Nominees P/L
Water And Rivers Commission
Alinta Gas
Burns Ratepayers, Residents & Community Recreation Association (Inc)
Conservation Council of WA
Department Of Resources Development
Friends of Brixton St Wetlands
Health Department Of WA
Landcorp
Les Norrish P/L
Main Roads Western Australia
Melville Conservation Group
Mindarie Regional Council
Murdoch Branch of the Wildflower Society of WA Inc
Quinns Rocks Environmental Group Inc
The National Trust Of Australia (WA)
The Vines Property Owners Association Inc
Urban Bushland Council
Water Corporation
Wildflower Society of WA Inc
Department of Minerals & Energy
Environmental Weeds Action Network (Inc)
Burns Management Pty Ltd
City Of Joondalup
City of Perth
City of Stirling
City of Wanneroo

Individual:

Mr A C Montgomery
C Pismiris Pty Ltd
Mr P A & Ms A V Murphy
Ms A & Mr P Dunn
Mr T C Taylor
Mr A W Lennon
Mr A Bowra
Ms J Mateljan
Mr P E Lorenz
Mr K P & Mrs M O'Malley
Mr R W Clifton
Mr B E Laycock
W R & W S Standing
Mr W J Toms
Mr J A Donald
Mr G R F Muller & JS E E Muller
Mr A Bush
Ms A L Munsie
Mr B & Ms J Kramer
Ms S A Foot
Mr J & Ms O Craigie
Ms D G & Mr T L Nevill
Ms A C Christodolou
Chris Christie
M, V, A, & I Karkalic
Ms D Deslandes
Mr P & Ms J L Glover
Mr R Honing
Ms M Kettell
Mr P H & Ms H P Brown
Mr R J & Ms K M Elliott
Mr R A B Stephenson
Ms J M Falls
Mr J C & Ms V A Meakins
Mr R Burrows
Ms E M C Doonan
Mr G A Drew
Mrs E Dove
J V Lofthouse
Mr W J Dale
Mr T F Barry
Ms G & Mr A Adams
Ms H & Mr R Drew
B A & R M Cole
C Meakin
E J Caporn
G & R Doherty
K & M Onus & N Hunt
K Hollywood
M G & V K Zakrevsky
Mr A Cotoreave
Mr A E Knight
Mr A G Thomson
Mr A W & Ms S Tarbox
Mr B & Ms C Hill

Mr A Pismiris
Mr P & Ms P Watson
Mr A J & Ms F E Rayfield
Mr C V Martino
Scorpio Nominees P/L
Mr D & Ms R Vicary
Mr T Bartuccio
Ms J V Lennon
Ms P & Mr A J Smith
Avoca Nominees P/L
Mr C & Ms G Strutt
L B C & H Birchall
Mr S C de Szoeko
A & O Lapping
Mr J Craigie
Mrs M Sauvage
Mr T & Ms B Cockman
Mr V Augins
Mr J & Mrs B Machura
Mr I & Ms H Palmer
Ms C M Anderson
Mrs M P Bailey
Ms Y Nicholls
Mr E Leaver & Ms B V Withell
Mr J E Smith
Mr T D & Ms B J Burt
Mr E & Ms A Rayfield
Mr M Craigie
Mr A K Richards
Ms J Legge
Mr R F Shaw
Mr R & Ms M E Gwynne
Mrs K Persak
Mrs E E Burrows
Ms S Cavar
Mr C S Hames
Mr W F & Ms B K Johns
Mr P J Smith
Mrs B D Hancock
Mr I & Ms R Mowczan
Mrs R Barry
Ms J Payne
D P & S B Jongeling
D P & S B Jongeling
J A & J T Darbyshire
K & T Henkel
L J Whiley
M W & M M Atkinson
Mr A De Pietro & Ms A Colletta
Mr A Even
Mr A M Davies
Mr B & Mrs I F Sulzbacher
Mr B & Ms M McKittrick
Mr B J Fleay
Mr B P Byass

Mr B Connor
Mr B Meakins
Mr B Sutherland
Mr C Farrell
Mr C Waite
Mr D A Alcock
Mr D Chadwick
Mr D Loveridge
Mr D Williamson
Mr F Falconer
Mr G & Ms C Malaspina
Mr G & Ms C Owen
Mr G D Falls
Mr G H Thornton
Mr G Heir
Mr I & Ms L Gouldsmith
Mr I L Hummerston
Mr J & Ms Skipworth
Mr J Ackroyd
Mr J C Massam
Mr J F Keelan
Mr J Jenkyn
Mr J Tonkin
Mr J Wilshire
Mr K Sarti
Mr L A & Ms B L Holm
Mr L J Peet
Mr L Maxwell & Ms I Harman
Mr M & Ms J Henderson
Mr M Donnelly
Mr M Harris
Mr M J Reeves
Mr M McSweeney
Mr N A Hummerston
Mr N Meakins
Mr O Mueller
Mr P Healy
Mr P R Hodgson
Mr R & Ms N Long
Mr R Chapple
Mr R J Giblett
Mr R Jacobson
Mr R R Trevenen
Mr R W Smith
Mr S Dorricott
Mr S K Norrish
Mr T Rodgers
Mr W & Ms M D Pinkerton
Mrs E Sumner
Mrs L Bryant
Ms A & Ms C Gadsdon
Ms A Herlihy
Ms B Jones
Ms C A McKittrick
Ms C Drake
Ms E Prime
Ms F Pratt
Ms G Etches

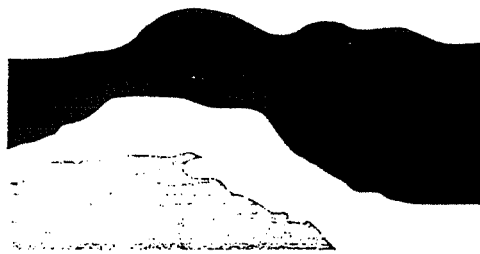
Mr C C Machura
Mr C Mills
Mr D & Ms J Carter
Mr D A Maxwell
Mr D F James
Mr D T Eves
Mr E W Pritchard
Mr F Marra
Mr G & Ms C Murray
Mr G B Carter
Mr G H Brown-Neaves
Mr G Hamersley
Mr H Lynch
Mr I L Cooper
Mr J & Ms D S Harvey
Mr J A Hemsley & Ms D J Hemsley
Mr J Anthony
Mr J Cheak & Ms M Young
Mr J Hollywood
Mr J Miller
Mr J W Penwill
Mr K Jones
Mr K T & Ms N A Meakins
Mr L J Hill
Mr L K Hawkes
Mr L Richards
Mr M & Ms L Ridley
Mr M Dunstan
Mr M J Norman
Mr M Linney
Mr M Peers
Mr N Cigulev
Mr N V Pearse
Mr P G Turner
Mr P L Morris
Mr R & Ms G Needham
Mr R B Mutton
Mr R G & Ms O E Thomas
Mr R J Hawkins
Mr R M Harris
Mr R Tauss
Mr S & Ms J Harman
Mr S Hutchison
Mr T & Ms Franco
Mr V Williams
Mr W J Boardman
Mrs J A Hill
Mrs M Holt
Ms A Carr
Ms A V Hodgson
Ms C A Marshall
Ms C Britlain & Mr J McKay
Ms D & Mr M Head
Ms F Patterson
Ms F Willcox
Ms G Green
Ms G Mauer
Ms Giz Watson MLC

Ms G L Edwards
Ms G Pennington
Ms H Cutri
Ms H M Leeder
Ms J Collins
Ms J Forster
Ms J Hawkes
Ms J Marchesi
Ms J Mason
Ms J Sutherland
Ms K Lowrie
Ms K Tullis
Ms L Garland
Ms L Scott
Ms M James
Ms M Jones
Ms M Loukes
Ms N Arrowsmith
Ms P Healy
Ms P M Robertson
Ms P S Norrish
Ms R Genett
Ms R Zelinova
Ms S Cockerill
Ms S Griffin
Ms S Thornton
Ms T Blackmore
Ms T Sampi
Ms V Endersby-Summers
Ms V Scott
Ms W Hopwood
Ms Y Svares
R & A McElroy
S & M Telford

Ms H J Cohen
Ms I Prentice
Ms J D Twine
Ms J Giblett
Ms J L Lyndhurst
Ms J Martini
Ms J Rundle
Ms J T Mutton
Ms K Shaw
Ms L Cook
Ms L M & Mr D J Yensch
Ms M G Bradley
Ms M Jenkin
Ms M Juan
Ms M Rickey
Ms N Grey
Ms P J McKay
Ms P Ollivier & Mr P Wittwer
Ms R E Mostyh
Ms R I Cahill
Ms S Barry
Ms S F Pertile
Ms S Kinnell
Ms S Tonkin
Ms T Castle
Ms V A Clarke
Ms V M Kohn & Mr J S Kohn
Ms W E Hodgson
Ms W Sorensen
P & B Scallon
R G. C. & W T Fleming
The Bleakley Family
The Russell Family Trust
The Hall Family

Appendix 2

**Correspondence received from the National Parks
and Nature Conservation Authority**



National Parks and
Nature Conservation Authority

Mr Bernard Bowen
Chairman
Environmental Protection Authority
141 St Georges Terrace
PERTH WA 6000

*noted
PnB. 29/2/00.
for Stacey Korley
(LB)*

Dear Bernard

**PROPOSED METROPOLITAN REGION SCHEME (MRS) AMENDMENT
992/33 CLARKSON BUTLER**

The National Parks and Nature Conservation Authority (NPNCA) considered your correspondence regarding the above Amendment at its meeting of Friday, 11 February 2000. At that meeting a further briefing on the amendment was provided by Mr Neil Foley of the Ministry for Planning.

In response to your further questions, the NPNCA has considered elements of this Amendment, including freeway severance, water supply infrastructure and cross park utilities on earlier occasions. In 1989 the NPNCA agreed to excisions from the south western corner of the Neerabup National Park, an area which would be isolated by the transport corridor, in exchange for the uncleared portion of lots 12 and 14 located between the parks south western boundary and Wanneroo Road. In subsequent meetings the alignment for the proposed railway alignment and railcar depot sites have been discussed and supported. The NPNCA has been proactive in requesting authorities to strategically review their cross park needs to rationalise use and reduce corridor crossings. The NPNCA has encouraged the Ministry of Planning to expedite rezoning and acquisition of land to be added to the park. Some of the rezoning has been undertaken and negotiations are currently underway for acquisition with the Water Corporation contributing to the cost.

The major issue for the NPNCA has been that of consolidating and integrating the railway line, roads and other utilities as part of the amendments. Fencing is an issue that is of concern to the NPNCA and consideration should be given to designing appropriate fencing in consultation with CALM.

The NPNCA at its meeting of 11 February indicated its support for the Amendment as proposed. The Authority considers that there are issues in relation to fauna movement and are uncertain as to the best outcome in relation to fauna underpasses or alternatives

FAXED	
PROTECTION AUTHORITY	
Date Received:	25/2/00
EPA File No.:	45-2-7
Correspondence	
Ref No.:	110837
<input type="checkbox"/> EVAL	EPA DRAFT REPLY <input type="checkbox"/>
<input type="checkbox"/> PPD	DEP DIRECT REPLY <input type="checkbox"/>
<input type="checkbox"/> POLICY	NOTE/FILE <input type="checkbox"/>
<input type="checkbox"/> ESD	<input type="checkbox"/>
<input type="checkbox"/> WMD	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
NOTES:	
Forwarded by:	

including the use of overpasses. The Authority would support the need for further research into the alternatives. There will be opportunities to monitor existing fauna underpasses between now and the proposed construction of these roads. This data will assist with discussions on whether to continue with fauna underpasses or how to improve their design.

The Authority has verified that CALM does not have access to definitive information regarding the vegetation values of the areas impacted. However, CALM has relied upon earlier work by Keighery BJ, Keighery GJ and Gibson N (attachment 1) and advice that the proposed additions to the south east are a significant benefit to the park in terms of vegetation and as a wider management corridor.

As far as management issues are concerned apart from fauna crossings the Authority considers that the major issues to be resolved are to ensure that the additions to the park are finalised and that future services crossing the park are consolidated into the two east west road carriageways as proposed.

Yours sincerely



Tom Day
CHAIRMAN

21 February 2000

U:\NPNCA\LETTERS\GOVT\MRS.DOC

Appendix 3

References

- Department of Planning and Urban Development (1992) *North-West Corridor Structure Plan (North of Hepburn Avenue)*, Department of Urban Development, March 1992, Perth WA.
- Department of Conservation and Environment (1983) *Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority - 1983. The Darling System - System 6*. October 1983, Perth WA.
- Ecologia (1996) Neerabup National Park Roads Biological Assessment. Unpublished report to the Ministry for Planning. August 1996.
- Ecologia (1997) Neerabup National Park Roads Biological Assessment - Spring Survey. Unpublished report to the Ministry for Planning. March 1997.
- Ecologia (1995) Wildlife Underpass Study Fauna Monitoring Program. Unpublished report to Main Roads Western Australia.
- Environmental Protection Authority (1990) Residential rezoning, subdivision and development, Burns Beach, Stage 2. Bulletin 485.
- Environmental Protection Authority (1993) Metropolitan Region Scheme Amendment No. 932/33 North-west corridor (Alkimos-Eglinton). Bulletin 729.
- Environmental Protection Authority (1998) Urban development in System 6 recommended areas M2 and M6, Pt Lot 2 between Marmion Avenue and Indian Ocean, Burns Beach. Bulletin 880.
- GHD (1996) Neerabup National Park - Lukin Drive, Hester Avenue, Neerabup Road. Planning Report Volumes 1 and 2. For the Ministry for Planning, October 1996.
- Government of Western Australia (1998) Perth's Draft Bushplan, Western Australian Planning Commission, November 1998, Perth WA.
- Griffin, E.A. and Trudgen, M. (1994) Variation in the floristic composition of the vegetation growing on the Holocene dunes between Whitfords and Lancelin, south-western Australia, and recommendations to conserve that variation. Unpublished report for Peet and Company, Perth WA.
- How, R.A., Harvey, M.S., Dell, J., and Waldoock, J.M. (1996) Ground fauna of the urban bushland remnants in Perth. Report to the Australian Heritage Commission. NEP Grant N93/04.
- Keighery, G.J. (1991) Flora and Vegetation of the Mindarie Cusp Area. An unpublished report to the Department of Conservation and Land Management for the Department of Planning and Urban Development, Perth WA.
- McArthur, M.W. and Bartle, G.A. (1980) Landforms and soils as an aid to urban planning in the Perth metropolitan north-west corridor, Western Australia. CSIRO Division of Land Resources Management Series No. 5.
- Semeniuk, V., Cresswell, I.D., and Wurm, P.A. (1989) The Quindalup Dunes: the regional system, physical framework and vegetation habitats. *Journal of the Royal Society of Western Australia* Vol 71 Pt 2 and 3 p23-47.
- Trudgen, M. (1990) A report on the flora and vegetation of an area at Burns Beach and conservation issues affecting it. Unpublished report to Halpern Glick Maunsell.

- Trudgen, M. (1996) An assessment of the conservation values of the remnant vegetation in the City of Wanneroo with recommendations for appropriate reserves for the City. An unpublished report for the City of Wanneroo.
- Western Australian Planning Commission (1999a) *Metropolitan Region Scheme Amendment No 992/33 Clarkson-Butler - Environmental Review Summary Report*. Western Australian Planning Commission, September 1999, Perth WA.
- Western Australian Planning Commission (1999b) *Metropolitan Region Scheme Amendment No 992/33 Clarkson-Butler - Amendment Report*. Western Australian Planning Commission, September 1999, Perth WA.
- Western Australian Planning Commission (1999c) . *Environmental Review - Metropolitan Region Scheme 992/33 Proposal 1: Proposed Urban and Parks and Recreation Rezoning, Western Cell, Lot 2 Burns Beach*. Western Australian Planning Commission, August 1999, Perth WA.
- Western Australian Planning Commission (1999d) . *Environmental Review - Metropolitan Region Scheme 992/33 Proposal 2: The rezoning of the Northern Portion of Lot 17 Marmion Ave, Clarkson from the Rural zone to the Urban Deferred zone*. Western Australian Planning Commission, September 1999, Perth WA.
- Western Australian Planning Commission (1999e) *Environmental Review - Metropolitan Region Scheme 992/33 Proposal 3: The Reservation of Two Proposed East-west District Distributor Roads between the Mitchell Freeway and Wanneroo Road for Other Regional Roads*. Western Australian Planning Commission, September 1999, Perth WA.
- Western Australian Planning Commission (1999f) *Environmental Review - Metropolitan Region Scheme 992/33 Proposal 4: Adjustment of the Existing Primary Regional Roads Reservation for Wanneroo Road*. Western Australian Planning Commission, September 1999, Perth WA.
- Western Australian Planning Commission (1999g) *Environmental Review - Metropolitan Region Scheme 992/33 Proposal 5: Reservation of the proposed Mitchell Freeway Transportation Corridor for Primary Regional Roads to enable future proposed extensions to the Mitchell Freeway and Northern Suburbs Railway; the reservation of land for Railways for the proposed Clarkson Railway Station near Neerabup Road and a possible station near Hester Avenue; and land surplus to Freeway requirements being transferred from Rural/Parks and Recreation to the Urban zone*. Western Australian Planning Commission, September 1999, Perth WA.
- Western Australian Planning Commission (1999h) *Environmental Review - Metropolitan Region Scheme 992/33 Proposal 6: The Reservation for A Railcar Stowage and Servicing Depot*. Western Australian Planning Commission, September 1999, Perth WA.
- Western Australian Planning Commission (2000) *Metropolitan Region Scheme Amendment No 992/33 Clarkson-Butler - Response to Submissions*. Western Australian Planning Commission, September 1999, Perth WA.

Appendix 4

Recommended Environmental Conditions

Recommended Environmental Conditions

STATEMENT THAT A SCHEME MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF DIVISION 3 OF PART IV OF THE ENVIRONMENTAL PROTECTION ACT 1986)

METROPOLITAN REGION SCHEME AMENDMENT No. 992/33 CLARKSON-BUTLER

Scheme Purpose: To amend the Metropolitan Region Scheme to accommodate modifications to the zones and reserves in the Clarkson-Butler district, including the following:

- (a) to rezone the south-eastern portion of the 'western cell' of Pt Lot 2 Burns from "Rural" zone to "Urban" zone and "Parks and Recreation" reservation;
- (b) to rezone the northern portion of Lot 17 Marmion Avenue, Clarkson from "Rural" and "Parks and Recreation" zone to "Urban Deferred" zone;
- (c) to reserve two proposed east-west district distributor roads (Hester Avenue and Neerabup Road) between the Mitchell Freeway and Wanneroo Road for "Other Regional Roads";
- (d) to adjust the existing "Primary Regional Roads" reservation for Wanneroo Road;
- (e) to reserve the proposed Mitchell Freeway Transportation Corridor for "Primary Regional Roads" to enable future proposed extensions to the Mitchell Freeway and Northern Suburbs Railway; the reservation of land for "Railways" for the proposed Clarkson Railway Station near Neerabup Road and a possible station near Hester Avenue; and land surplus to Freeway requirements being transferred from "Rural" and "Parks and Recreation" to "Urban" zone; and
- (f) to reserve the proposed railcar stowage and servicing depot between Hester Avenue and Lukin Drive for "Primary Regional Roads".

Conditions are set for the abovementioned modifications. These modifications are referred to below as:

- (a) "Urban" zoning Burns Beach;
- (b) "Urban Deferred" zoning Clarkson;
- (c) Reservation of the two east-west roads;
- (d) Adjustments to Wanneroo Road reservation;
- (e) Alignment for Mitchell Freeway and Northern Suburbs Rail System; and
- (f) Reservation for Railcar Depot.

Responsible Authority: Western Australian Planning Commission

Responsible Authority Address: 469 Wellington St
PERTH WA 6000

Assessment Number: 1139

Report of the Environmental Protection Authority: Bulletin 971

Subject to the following conditions, there is no known environmental reason why the Metropolitan Region Scheme amendment, excluding the rezoning of 115 ha of the south-western portion of the 'western cell' of Pt Lot 2 Burns from "Rural" zone to "Urban" shown in Attachment 1, to which the above report of the Environmental Protection Authority relates should not be implemented:

ENVIRONMENTAL CONDITIONS

1. "Urban Deferred" zoning Clarkson

1-1 Environmental Management Plan

1-1-1 Prior to the lifting of the "Urban Deferred" zone on any part of the proposal area, the Responsible Authority shall require preparation of an Environmental Management Plan for the proposed "Urban Deferred" zoning Clarkson, to ensure the protection and management of biodiversity in Tamala Park and Neerabup National Park, that may be affected directly or indirectly by development of the proposal area.

This Plan shall include:

1. retention of good quality remnant vegetation in public open space reserves giving consideration to the reservation status of the vegetation communities in the proposal area and the aim to strengthen the east-west linkage from Neerabup National Park to the coast;
2. management of public open space, including public access, recreation, weeds, feral animals, fire, drainage, fencing and signage;
3. management of the interface between urban development and the adjacent conservation reserves in terms of "edge effects" and fauna movement;
4. control of off-road vehicle use and dumping of rubbish;
5. a spring flora survey of the area to determine the presence of Declared Rare and Priority flora, with particular searches for *Hibbertia spicata* and *Jacksonia sericea*, and provision of appropriate management measures, to the satisfaction of the Department of Conservation and Land Management;
6. management of Specially Protected (Threatened) Fauna;

7. nature and compatibility of land development adjacent to the conservation reserves;
 8. proposals for revegetation;
 9. promotion of community awareness of bushland protection; and
 10. allocation of responsibilities and timing for implementation.
- 1-1-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plans, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

1-2 Stygofauna and Troglobitic Fauna Management

- 1-2-1 If karst formations are discovered within the proposed “Urban Deferred” zoning Clarkson which indicate the likelihood of significant stygofauna and/or troglobitic fauna assemblages being present in or immediately adjacent to the amendment area, the landowner (with assistance from relevant scientific experts) shall undertake a survey to assess the nature and extent of any population/s and if population/s are identified a Management Plan shall be prepared to address the potential impacts on these population/s.

This survey and Management Plan shall be completed and implemented to the requirements of the Responsible Authority on advice of the Department of Conservation and Land Management, WA Museum and the University of Western Australia (Department of Zoology).

1-3 Assessment of Karst Landform

- 1-3-1 The landowner shall undertake geotechnical site investigations to confirm the nature and extent of karst landform within the proposed “Urban Deferred” zoning Clarkson within the amendment area if any karst formations are discovered within the amendment area.

This investigation shall be completed prior to the survey and Management Plan identified in Condition 2-2-1 being finalised to the requirements of the Responsible Authority on advice of the Department of Environmental Protection.

1-4 Buffer from Tamala Park Landfill

- 1-4-1 The Responsible Authority shall ensure that provisions are included in the Local Scheme Amendment text within the proposed “Urban Deferred” zoning Clarkson to preclude residential land uses from within 500 metres of the active face of any existing or proposed putrescible filling area. Encroachments within this buffer may be accepted if it is demonstrated to the Environmental Protection Authority, through appropriate studies and investigations that odour, noise, landfill gas and dust will not adversely impact on future residents .

2. Reservation of the two east-west roads

2-1 Vegetation and Fauna Management Plan

2-1-1 Prior to the finalisation of detailed design plans for the construction of the two east-west roads, the Responsible Authority shall require preparation of a Vegetation and Fauna Management Plan to ensure the protection and management of biodiversity in Neerabup National Park that may be affected directly or indirectly by development of the proposal area.

This Plan shall include:

1. provision for revegetation;
2. a weed control program;
3. a dieback management plan including dieback survey within the proposed alignments;
4. a fire management plan; and
5. a fauna survey for scheduled and priority fauna species, to be undertaken along the proposed alignments to delineate usage of sites within the project area;
6. relocation of individual scheduled and priority fauna if their ranges lie within or overlap the area of the proposed alignment;
7. investigation into the alternatives for facilitation of fauna movement across each alignment;
8. monitoring of fauna movement across each alignment;
9. investigation into measures that will reduce the existing pressures, such as introduced species, disease and increased road deaths, on fauna populations within Neerabup National Park; and
10. allocation of responsibilities and timing for the implementation.

2-1-2 The above Vegetation and Fauna Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

2-2 Construction Management Plan

2-2-1 Prior to the finalisation of detailed design plans for the two east-west roads, the Responsible Authority shall require preparation of a Construction Management Plan to ensure the protection and management of biodiversity in Neerabup National Park.

This Plan shall include:

1. management of drainage incorporating best practice Water Sensitive Design principles, in consultation with the Water and Rivers Commission, which considers the implications to existing vegetation and groundwater quality from both sumps and altered surface hydrology to minimise potential for waterlogging and infiltration of pollutants to groundwater;
2. investigation for the presence of caves during clearing for construction and management of discovery;
3. investigation for the presence of subterranean fauna within any cave or karst system encountered in areas cleared or cut during construction, and designation of appropriate management measures;
4. the erection of exclusion fencing of the alignment area as designated by the 'extent-of-works' prior to any clearing for construction,
5. the use of lighting along the roads to assist in the reduction of road deaths of nocturnal terrestrial fauna species;
6. a summary of the management measures identified in 2-1-1 that require action during construction activities; and
7. allocation of responsibilities and timing for the implementation.

2-2-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

2-3 Referral of Proposed Neerabup Road

2-3-1 Prior to the finalisation of the design, the proposed Neerabup Road shall be referred to the Environmental Protection Authority under Section 38 of the Environmental Protection Act.

3. Adjustments to Wanneroo Road reservation

3-1 Vegetation and Fauna Management Plan

3-1-1 Prior to the detailed design plans for the construction of the proposed adjustments to Wanneroo Road, the Responsible Authority shall require the preparation of a Vegetation and Fauna Management Plan to ensure the protection and management of biodiversity in Neerabup National Park and Nowergup Lake Fauna Sanctuary that may be affected directly or indirectly by development of the proposal area.

This Plan shall include:

1. a comprehensive spring survey for Declared Rare Flora and Priority taxa;
2. provision for revegetation of cleared or degraded areas;
3. a weed control program;

4. a dieback management plan including dieback survey within the proposed alignments;
5. a fire management plan;
6. a fauna survey for scheduled and priority fauna species, to be undertaken in spring along the affected areas prior to commencement of any site works to delineate usage of sites within the project area by rare fauna;
7. relocation of individuals if their ranges lie within or overlap the area of the proposed alignment adjustments; and
8. allocation of responsibilities and timing for implementation.

3-1-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Conservation and Land Management.

3-2 Construction Management Plan

3-2-1 Prior to the finalisation of detailed design plans for the construction of the adjustments to Wanneroo Road, the Responsible Authority shall require preparation of a Construction Management Plan to ensure the protection and management of biodiversity in Neerabup National Park and Nowergup Lake Fauna Sanctuary .

This Plan shall include:

1. management of drainage incorporating best practice Water Sensitive Design principles, in consultation with the Water and Rivers Commission, which considers the implications to existing vegetation, nearby wetlands and groundwater quality from both sumps and altered surface hydrology to minimise potential for waterlogging and infiltration of pollutants to surfacewater and groundwater;
2. investigation for the presence of caves during clearing for construction and management of discovery;
3. design of the vertical and horizontal alignment of the road to reduce the extent of cut and fill required and to fit in with the landscape setting;
4. investigation for the presence of subterranean fauna within any cave or karst system encountered in areas cleared or cut during construction, and designation of appropriate management measures;
5. the erection of exclusion fencing along areas as designated by the 'extent-of-works' prior to any clearing for construction,
6. a summary of the management measures identified in 3-1-1 that require action during construction activities; and
7. allocation of responsibilities and timing for implementation.

3-2-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Conservation and Land Management.

4. Alignment for Mitchell Freeway and Northern Suburbs Rail System

4-1 Vegetation and Fauna Management Plan

4-1-1 Prior to commencement of site works the Responsible Authority shall require preparation of a Vegetation and Fauna Management Plan for the alignment for Mitchell Freeway and Northern Suburbs Rail System to ensure the protection and management of biodiversity in Neerabup National Park that may be affected directly or indirectly by development of the proposal area.

This Plan shall include:

1. further flora survey work between Burns Beach Road and Hester Avenue to identify populations of Declared Rare Flora or Priority taxa;
2. targeted flora survey for *Acacia benthamii* and *Eucalyptus argutifolia* within Neerabup National Park and designation of appropriate management measures;
3. provision for revegetation of cleared or degraded areas within and adjacent to the amendment area;
4. a weed control program,
5. a dieback management plan including dieback survey within the proposed alignment;
6. a fauna survey for scheduled and priority fauna species, to be undertaken along and adjacent to the proposed alignment to delineate usage of sites within the project area;
7. relocation of individual scheduled and priority fauna if their ranges lie within or overlap the area of the proposed alignment;
8. investigation into the alternatives for facilitation of fauna movement across each alignment;
9. monitoring of fauna movement across each alignment; and
10. allocation of responsibilities and timing for the implementation of the Vegetation and Fauna Management Plan:

4-1-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

4-2 Construction Management Plan

4-2-1 Prior to the finalisation of detailed design plans for the proposed freeway and/or railway, whichever occurs first, the Responsible Authority shall require preparation of a Construction Management Plan to ensure the protection and management of biodiversity in Neerabup National Park.

This Plan shall include:

1. management of drainage incorporating best practice Water Sensitive Design principles, in consultation with the Water and Rivers Commission, which considers the implications to existing vegetation and groundwater quality from both sumps and altered surface hydrology to minimise potential for waterlogging and infiltration of pollutants to groundwater;
2. investigation for the presence of caves during clearing for construction and management of discovery;
3. investigation for the presence of subterranean fauna within any cave or karst system encountered in areas cleared or cut during construction, and designation of appropriate management measures on advice of the Department of Environmental Protection;
4. the erection of exclusion fencing of the alignment area as designated by the 'extent-of-works' prior to any clearing for construction, paying particular attention to retaining as many mature trees as possible;
5. control of the use of lighting along the alignment to assist in the reduction of road deaths of nocturnal terrestrial fauna species and provide a safe environment for road and rail users;
6. compliance with appropriate dust, noise and vibration standards and guidelines during construction; and
7. allocation of responsibilities and timing for implementation.

4-2-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

4-3 Noise and Vibration Management Plan

4-3-1 Prior to the finalisation of detailed design plans for the proposed freeway and/or railway, which ever occurs first, the Responsible Authority shall require preparation of a Noise and Vibration Management Plan to ensure noise and vibration impacts do not adversely impact on existing and future residents in the vicinity of the proposed alignment for the Mitchell Freeway and Northern Suburbs Railway.

This plan will include:

1. predictions of noise levels from vehicles and trains along the length of the alignment but focussing primarily in urban areas;
2. details of noise management measures to ensure compliance with an internal noise standard of 35dB(A) between 2200 and 0700 hours;
3. procedures for monitoring the effectiveness of noise management measures once implemented;
4. further investigation to determine the potential level of vibration in adjacent urban areas and designation of appropriate controls to comply with AS 2670.2-1990: Evaluation of human exposure to whole-body vibration – Part 2: Continuous and shock induced vibration in buildings (1 to 80 Hz);
5. a complaints response procedure; and

5. a complaints response procedure; and
6. allocation of responsibilities and timing for implementation.

4-3-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection.

5. Reservation for Railcar depot

5-1 Vegetation and Fauna Management Plan

Prior to commencement of site works, the Responsible Authority shall require preparation of a Vegetation and Fauna Management Plan for the Railcar depot to ensure the protection and management of biodiversity in Neerabup National Park that may be affected directly or indirectly by development of the proposal area.

This Plan shall include:

1. a comprehensive spring survey for Declared Rare and Priority Flora and designation of appropriate management measures
2. provision for revegetation and rehabilitation of the proposal area and the degraded area of Neerabup National Park adjacent to the proposed railcar depot;
3. targeted flora survey for *Acacia benthamii* within Neerabup National Park and designation of appropriate management measures;
4. a weed control program;
5. dieback management plan including dieback survey within the proposed alignment;
6. fire management plan;
7. targeted fauna survey for scheduled and priority fauna species, to be undertaken in the area of the amendment and adjacent area to delineate usage of sites within the project area;
8. relocation of individual scheduled and priority fauna if their ranges lie within or overlap the area of the proposed alignment;
9. investigation into the alternatives for facilitation of fauna movement across each alignment;
10. monitoring of fauna movement across each alignment; and
11. allocation of responsibilities and timing for implementation.

5-1-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

5-2 Construction Management Plan

require preparation of a Construction Management Plan to ensure the protection and management of biodiversity in Neerabup National Park that may be affected directly or indirectly by development of the proposal area.

This Plan shall include:

1. management of drainage incorporating best practice Water Sensitive Design principles, in consultation with the Water and Rivers Commission, which considers the implications to existing vegetation and groundwater quality from both drainage structures and altered surface hydrology to minimise potential for waterlogging and infiltration of pollutants to groundwater;
2. investigation for the presence of caves during clearing for construction and management of discovery;
3. investigation for the presence of subterranean fauna within any cave or karst system encountered in areas cleared or cut during construction, and designation of appropriate management measures;
4. the erection of exclusion fencing of the proposal area as designated by the 'extent-of-works' prior to any clearing for construction, paying particular attention to retaining as many mature trees as possible;
5. compliance with appropriate dust, vibration, light and safety standards and guidelines during construction; and
6. allocation of responsibilities and timing for implementation.

5-2-2 The above Environmental Management Plan shall be implemented in accordance with the provisions of the Plan, to the requirements of the Responsible Authority on advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

5-3 Noise and Vibration Management Plan

5-3-1 Prior to the finalisation of detailed design plans for the proposed freeway and/or railway and railcar depot, whichever occurs first, the Responsible Authority shall require preparation of a Noise and Vibration Management Plan to ensure noise and vibration impacts do not adversely impact on existing and future residents in the vicinity of the proposed railcar depot.

This plan will include:

1. predictions of noise levels from vehicles and trains along the length of the alignment but focussing primarily in urban areas;
2. impact of the operation of the railcar stowage and servicing facility on noise levels;
3. details of noise management measures to ensure compliance with an internal noise standard of 35dB(A) Leq between 2200 and 0700 hours;
4. procedures for monitoring the effectiveness of noise management measures once implemented;
5. further investigation to determine the potential level of vibration in adjacent urban areas and designation of appropriate controls to comply with AS 2670.2-

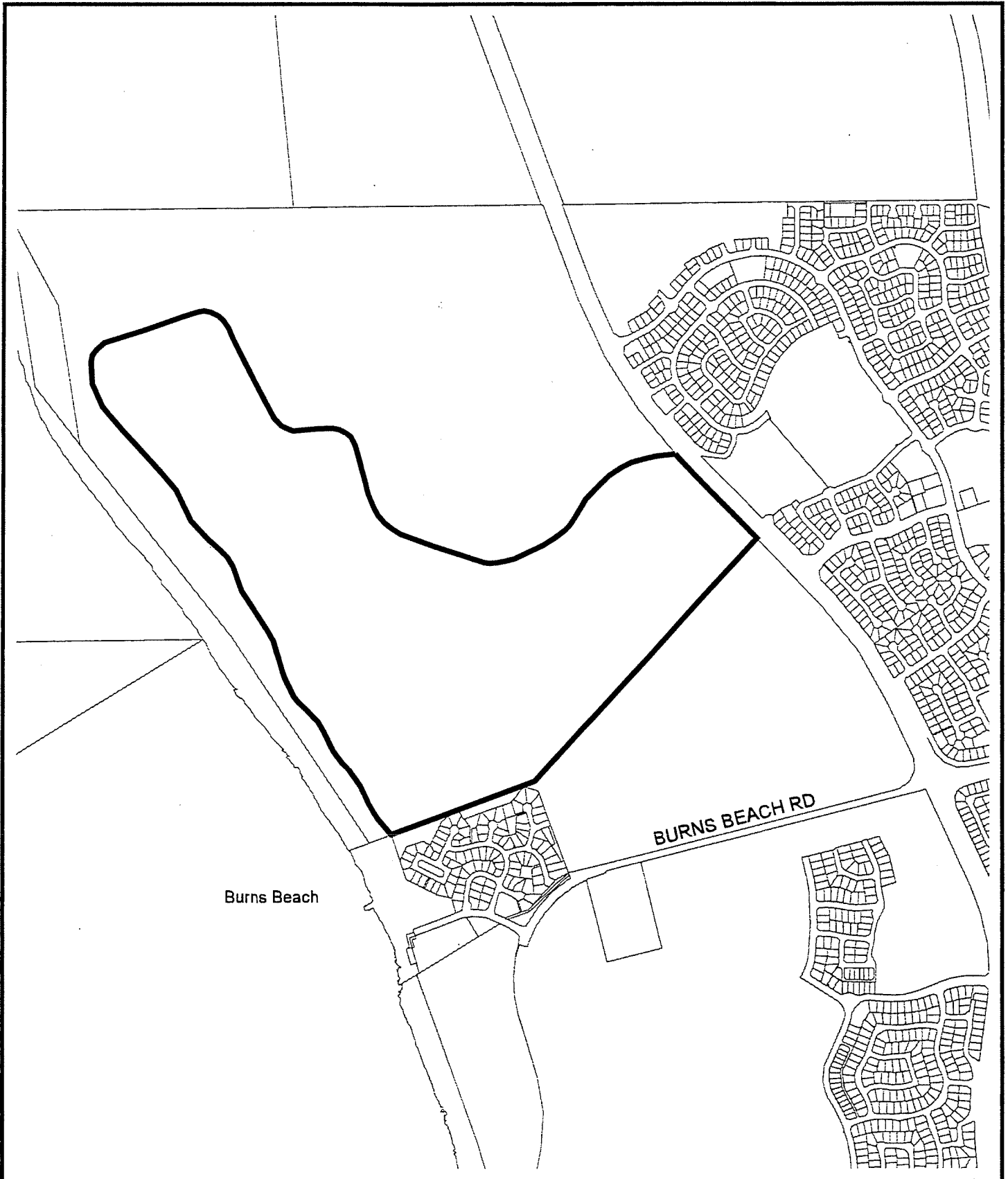
1990: Evaluation of human exposure to whole-body vibration – Part 2: Continuous and shock induced vibration in buildings (1 to 80 Hz); and


6. a complaints response procedure.

5-3-2 A Construction Noise Management Plan shall be prepared if work is to be undertaken outside of daylight hours. Noise levels shall comply with AS2436: Guide to Noise Control on Construction, Maintenance and Demolition Sites and the *Environmental Protection (Noise) Regulations, 1997*.

The Plan shall include:

1. details of and reasons for construction work outside recommended hours;
2. predictions of construction noise levels;
3. details of noise control measures to be implemented;
4. procedures for on site monitoring; and
5. complaint response procedures.



 Area excluded from the MRS Amendment 992/33

 Cadastral Boundaries

0 0.1 0.2 0.3 0.4 0.5 Kilometers



1:15000

Department of Environmental
Protection Western Australia



Projection: Australian Map Grid

This map has been produced using various data from other agencies. No responsibility is accepted for any error or omission.

Exclusion area and Cadastral supplied courtesy of MIP

Attachment 1:
South-western portion of the 'western cell' of Pt Lot 2 Burns
excluded from rezoning from "Rural Zone" to "Urban Zone"

Appendix 5

**Response by the Responsible Authority to environmental
issues raised in submissions**

WESTERN AUSTRALIAN PLANNING COMMISSION

**METROPOLITAN REGION SCHEME AMENDMENT 992/33
CLARKSON-BUTLER**

RESPONSE TO SUBMISSIONS

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INTRODUCTION

Major Metropolitan Region Scheme (MRS) Amendment 992/33 Clarkson-Butler (“the amendment”) contains eleven proposals for rezoning and reservation in the north-west corridor of the metropolitan region. The responsible authority, the Western Australian Planning Commission (WAPC) initiated the amendment to fully implement the planned land use zonings and reservations contained within the *North West Corridor Structure Plan* (DPUD, 1992).

The amendment was referred to the Environmental Protection Authority (EPA) in May 1997. Of the eleven proposals, six were considered by the EPA to have the potential to significantly impact the environment. Level of assessment was set at Environmental Review in June 1997 and final Instructions were issued by the EPA on 25 March 1999

The six proposals subject to formal environmental assessment under Section 48A of the *Environmental Protection Act 1986* are (refer to plan of the amendment - Figure 1):

- Proposal 1. The rezoning of the south eastern portion of the ‘western cell’ of Pt Lot 2 Burns from the Rural zone to the Urban zone and Parks and Recreation reservation;
- Proposal 2. The rezoning of the northern portion of Lot 17 Marmion Avenue, Clarkson from the Rural zone to the Urban Deferred zone;
- Proposal 3. The reservation of two proposed east-west district distributor roads between the Mitchell Freeway and Wanneroo Road for Other Regional Roads;
- Proposal 4. Adjustments of the existing Primary Regional Roads reservation for Wanneroo Road;
- Proposal 5. Reservation of the proposed Mitchell Freeway Transportation Corridor for Primary Regional Roads to enable future proposed extensions to the Mitchell Freeway and Northern Suburbs Railway; the reservation of land for Railways for the proposed Clarkson Railway Station near Neerabup Road and a possible station near Hester Avenue; and land surplus to Freeway requirements being transferred from Rural/Parks and Recreation to the Urban zone; and
- Proposal 6. The reservation for the Railcar Stowage and Servicing Depot.

Separate Environmental Review documents were prepared by the WAPC for each of the six proposals above, together with a summary document. The Environmental Reviews were released for public comment on 28 September 1999 with submissions closing on the 31 December. 352 submissions were received by the WAPC.

A summary of the main issues and views raised in the submissions and the response to these issues follows. The submissions generally fall into three categories: (i) those that discuss the Amendment as a whole; (ii) those that discuss Proposal 1; and (iii) those that discuss the remaining proposals and their potential impact on Neerabup National Park.

For ease of understanding, the submissions and the response to the issues raised have been classified according to these three categories. Notations in brackets after some of the issues identify the agency that made the submission. In section 3, the notation in brackets also refers to the proposal that the submission relates to.

1. GENERAL SUBMISSIONS ON THE AMENDMENT – ALL PROPOSALS

Biophysical

1.1 Vegetation communities

1.1.1 Why is there no legislation that protects all remaining bushland in the metropolitan area?

In view of the continued urban expansion of the Perth Metropolitan Region (PMR), the Western Australian Government is seeking solutions to the problem of protecting natural areas. Currently, vegetation clearing is regulated under the *Soil and Land Conservation Act, 1945* on Rural zoned lands. The WAPC has protected a substantial area of bushland in the PMR through the reservation of land for Parks and Recreation, for which the System 6 Report has been a guiding force.

The question of how much should be protected must be considered in the light of competing social, economic, political and conservation objectives. It is the intent of the Government's draft Perth's Bushplan (1998) to provide for protection and integrated planning of regionally significant bushland in the metropolitan area. Other remaining areas of bushland are the recognised responsibility of local government authorities to address.

Perth's Bushplan aims to establish a representative system of protected areas in the PMR. Under draft Perth's Bushplan, regional assessments of remnant bushland and associated wetlands have been undertaken according to defined criteria to identify the 52,200ha of regionally significant bushland recommended for protection. The legislative mechanisms for protection of bushland have in the past relied primarily on reservation and acquisition under the Metropolitan Region Scheme (MRS) or the *Land Act, 1993*. In addition, protection under the *Conservation and Land Management Act, 1984* provides the highest level of protection for high conservation value natural areas such as those recommended in draft Perth's Bushplan.

Furthermore, a Memorandum of Understanding (MOU) exists between the Commission for Soil and Land Conservation, Agriculture WA, the EPA, the Department of Environmental Protection (DEP), the Department of Conservation and Land Management (CALM) and the Water and Rivers Commission (WRC) which establishes a process to implement the Cabinet decision of May 1995 requiring nature conservation as well as land degradation impacts to be taken into account when deciding on clearing proposals. Under the MOU, land zoned 'Rural' in the MRS is covered by the *Soil and Land Conservation Act, 1945* to prevent clearing of bushland of more than one hectare in size without approval of the Commissioner for Soil and Land Conservation.

The question of the need for future legislation to protect the remaining bushland in the PMR is beyond the scope of this amendment.

1.1.2 Our bushland are vital remnants of unique plant communities necessary for the quality of our soil, air and water - and therefore inseparable from the health and well being of the human community. The clearing of our bushland remnants is no longer acceptable to solve our housing and transport problems.

On purely environmental grounds, it could be argued that there should be no further clearing of native vegetation on the Swan Coastal Plain. However, this is impractical while Perth's population grows and urbanisation continues. Furthermore, the ongoing management of many small and isolated patches of bushland would be of questionable merit at least.

At the regional level, the planning process has protected land for water and vegetation conservation areas. The process has also reserved land for urban development, community needs and infrastructure purposes in a controlled manner that reduces the environmental and societal impacts of land management. Bushland conservation must be balanced against the other competing land requirements of the expanding metropolitan population, in addition to the real question of survivability of bushland remnants in their urban setting.

It is also important to recognise existing planning for Perth, such as the *North-West Corridor Structure Plan* (WAPC, 1992). This amendment consolidates planning for the corridor as set out in the structure plan. Nevertheless, the need to protect native vegetation of the Swan Coastal Plain has been recognised by the WA Government in their initiative, draft Perth's Bushplan. The principal objective of Bushplan is to conserve representative portions of vegetation complexes at the regional level.

With regards to this amendment, it is in recognition of the importance of our natural vegetation that such a substantial proportion of the privately owned land of Pt Lot 2 (125 ha or 53%) will be set aside for conservation purposes as part of a 305ha proposed regional open space area at Mindarie (Proposal 1).

With regards to Proposal 2, the *North-West Corridor Structure Plan* shows the proposal area as future urban development. The proposal area is located adjacent to vegetation recognised for its regional conservation values under draft Perth's Bushplan. On this basis, it can be assumed that the proposed reservation of representative portions of significant vegetation at the regional level has been addressed in the vicinity of Proposal 2. Exclusion of the area of Proposal 2 from draft Perth's Bushplan does not however, reduce the potential of local significance of the vegetation it contains. The retention of locally significant vegetation within the proposal area is acknowledged as important and will be addressed through the preparation of a Vegetation Management Plan and at the District and Local Structure Planning levels so that issues such as the conservation values of the various types of vegetation and fauna habitats present in the north of Lot 17 are addressed.

It is acknowledged that Proposals 3 to 6 impact Neerabup National Park, however, the amendment proposes to reserve 190ha of mostly pristine vegetation for conservation purposes in the vicinity of the Park. Overall, the

amendment will result in an improved level of protection of remnant vegetation in the region and an increase in the National Park. This remnant vegetation will be protected from clearing through its eventual inclusion in Neerabup National Park.

1.1.3 Bushland is an integral part of Perth's character and must be maintained.

Although the region's extensive bushland areas help to sustain the image of Perth as the 'City in the Bush', continued urban expansion has led to a focus on the need to protect the integrity of natural systems and representative examples of remnant bushland. Responding to these requirements successive State Governments have set aside areas of regional significance for conservation and recreation with approximately 32,000ha reserved as 'Parks and Recreation' under the MRS in the past seven years. Perth's Bushplan proposes to follow this example by ensuring that appropriate areas of bushland and associated wetlands are reserved for the conservation of biological diversity and recreation.

The Government's Urban Bushland Strategy recognises the significance of bushland in the urban context to define and enhance Perth's character and seeks to ensure that this is maintained.

In addition, refer to Responses 1.1.1 and 1.1.2.

1.1.4 The vegetation is the Cottesloe Central and South complex, the western extent of which is poorly represented in the conservation estate (Trudgen 1990).

The majority of vegetation in the amendment area is broadly classified as the Cottesloe Complex – Central and South. This vegetation complex is found on the soils of the Spearwood dunes, in close proximity to the coast. At least 36% of the original extent of this Complex remains in the PMR, and 15% of the original area is currently protected. In addition, 6,442ha is proposed for protection in draft Perth's Bushplan, resulting in protection of around 19% of the original extent of the vegetation.

Within the context of Bushplan's stated objective of a minimum area of 10% preservation, this complex can be regarded as well conserved and certainly far better conserved than many other vegetation assemblages.

This amendment proposes to reserve over 170ha of vegetation of the Cottesloe Complex – Central and South.

1.2 System 6/ Bushplan

1.2.1 The 1998 "State of the Environment Report" states "Without proactive management by all sections of society, biodiversity will continue to decline. Ultimately this will affect our own well being".

Perth's Bushplan is a proactive, whole of Government approach to improve the representation of the ecological communities and habitats of the Perth region. The objectives of Perth's Bushplan have been based on the principles of the National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth of Australia, 1996) *'to establish a comprehensive, representative and adequate system of ecologically viable protected areas integrated with sympathetic management of all other areas...'*

The net benefit to the conservation estate from the proposed reservation of over 460ha of remnant vegetation in this amendment, together with the management measures proposed in the *Environmental Review Summary Report*, support the goals of the *State of the Environment Report* with respect to biodiversity conservation.

1.2.2 The State has responsibilities under the National Strategy for the Conservation of Australia's Biological Diversity. Bushplan sites are necessary in order to provide a comprehensive, adequate and representative collection of plant communities within the Swan Coastal Plain.

Agreed. This amendment contributes significantly towards the implementation of draft Perth's Bushplan through the proposed reservation of remnant vegetation contained within Bushplan sites 383, 322 and 323. Refer also to response 1.2.1.

1.2.3 The argument that plenty of bushland of an identical nature can be found elsewhere is disputed by the Urban Bushland Council. The logical consequence to this reasoning is that we keep clearing until vegetation becomes rare and endangered.

The *Environmental Review Summary Report* does not state at any time that identical bushland can be found elsewhere. The Clarkson Butler amendment provides for 305 ha of coastal vegetation linked to a further 190 ha of vegetation inland to provide for the conservation of representative vegetation units.

1.2.4 Do not support the rezoning of the south western portion of Lot 17 Marmion Avenue, Mindarie from "Rural" to "Parks and Recreation" reservation, pending further discussions and negotiations with the owner Councils (City of Joondalup, City of Perth).

Noted. However, this site was recommended for conservation by the System 6 report (DCE, 1983) and is also contained within draft Perth's Bushplan (Site 322). Reservation of this area is consistent with recommendations for conservation and the site is considered to be a vital part of the east-west link between Neerabup National Park and the coast.

- 1.2.5 The boundary of the Public Purposes reservation should be reviewed in light of the current and future requirements of the Tamala Park Refuse Facility (City of Stirling, City of Perth).

The proposed boundary of the Tamala Park Refuse Facility (i.e. the proposed Public Purposes reservation) reflects that proposed in the *North West Corridor Structure Plan*. Stages 2 & 3 of the Tamala Disposal Facility are proposed to occur within the Public Purposes reserve proposed by this amendment. Operational buffers for these stages will be maintained in accordance with the requirements of the EPA.

- 1.2.6 A need for a lateral open space wedge between Neerabup National Park and the coast is recognised and the southern sector of leased land may well be useable for this purpose, given no waste management usage for this area has been identified. (Mindarie Regional Council)

Agreed. Amendment 992/33 proposes to reserve land adjacent to Neerabup National Park totalling 190ha for Parks and Recreation, and a further 277ha of land in Tamala Park and Burns Beach for Regional Open Space equating to 467ha to be reserved for conservation purposes. On this basis, the east-west link between the coast and Neerabup National Park will be retained and enhanced as part of the Amendment process.

The southern portion of Lot 17, particularly the vegetation surrounding the Tamala Waste Disposal Site is identified as draft Bushplan Site 323, which joins Burns Beach bushland, Site No. 322. Site No. 323 is recognised in the draft Perth's Bushplan as being part of a regionally significant contiguous bushland linkage between Burns Beach Bushland and Neerabup National Park (Government of WA, 1998). The southern portion of Lot 17 will be enhanced to maintain the conservation linkage between the coast and the National Park in agreement with conditions of operation of the facility.

1.3 Terrestrial fauna

- 1.3.1 Loss of native species is occurring at an unprecedented rate with loss of habitat listed as the main reason of decline.

Major areas of high quality, regionally significant vegetation and fauna habitat, including areas that are already allocated and reserved for conservation purposes, are identified in draft Perth's Bushplan. Regional studies such as this provide a basis to guide planning and development to minimise environmental impacts and habitat losses. Retention of areas of local habitat will be addressed in the recommended environmental management plans outlined in the *Environmental Review Summary Report* for the amendment.

Additionally, provision is made for the retention of 305ha of continuous coastal dune fauna habitat at Mindarie under the proposal, linked in a corridor

sense to a further 170ha in Bushplan Site 323 and on to Neerabup National Park. This is a substantial corridor of habitat, similar in ecological value to Bold Park which has been shown to be one of the most valuable fauna refuges in the Perth metropolitan region (How, 1998).

Furthermore, the substantial increase in the overall size of Neerabup National Park as a result of the addition of land to compensate for the proposed excision required for the east-west roads, transportation corridor and railcar depot should ultimately result in improved habitat for native species found in the area, as this land will not be available for development.

1.4 Aboriginal Culture and Heritage

1.4.1 A Section 16 permit will be required under the *Aboriginal Heritage Act 1972* for the purposes of monitoring and mitigative salvage of any Aboriginal material unearthed during developments. Prior to works commencing a section 16 application must be submitted to the Aboriginal Cultural Material Committee which makes recommendations to the Minister in this regard (Aboriginal Affairs Department).

Archaeological and ethnographic studies have already been undertaken at the locations impacted by the amendment, and these have been referred to the Aboriginal Affairs Department. The responsible authority recognises the requirement to apply for a Section 16 permit under the *Aboriginal Heritage Act 1972*, and will conform to all statutory requirements. All necessary approvals will be obtained prior to construction.

1.5 Other

1.5.1 Why has the Government not developed an environmentally sustainable population policy? This should be done as a matter of urgency and should be based upon the precautionary principle.

Noted. The *State of the Environment Report (Australia)* identified the need to evaluate the carrying capacity of Australia to ensure long-term ecologically sustainable development, however, this is beyond the scope of this amendment.

1.5.2 The work of Peter Newman and Jeff Kenworthy has shown that Perth is an extreme example of urban sprawl, a consequence of basing passenger transport on private cars and extravagant use of land. Perth is one of the most sprawled out lowest density cities in the world. Do we need further extension of the urban zone in Clarkson-Butler as against urban consolidation? (Proposal 1, 2 & 5)

The Metropolitan Region Scheme currently includes urban and urban deferred zonings on land as far north as Two Rocks, up to 60 km from the Perth city centre. The urban and urban deferred land proposed in this amendment is

around half this distance from the Perth city centre and is comparatively well served by proposed railway stations at Clarkson, Merriwa and Currambine. Urban development at these locations does represent urban consolidation within the overall metropolitan context and will delay the need for development further out on the fringe of the metropolitan area.

1.5.3 Who will actually prepare the Management plans proposed to be undertaken in the Environmental Reviews? (City of Wanneroo).

The authority that is responsible for construction of the proposed facility in question will be required to prepare the necessary Environmental Management Plans before construction can proceed as follows:

- For Proposal 1, the Management Plans will be prepared by the land developers as detailed in the draft Environmental Management Measures in the Executive Summary of the Environmental Review for Proposal 1.
- Prior to the lifting of the 'Urban Deferred' zoning over the northern portion of Lot 17 (Proposal 2) a Vegetation and Fauna Management Plan will be prepared by suitably qualified personnel on behalf of the owner councils to the satisfaction of the Department of Conservation and Land Management.
- In the case of Proposal 3 (east-west roads) it is anticipated that the authority responsible for road construction and, therefore, for preparation of the Environmental Management Plans will be the City of Wanneroo.
- The proponent for Proposal 4 (Wanneroo Road) is MRWA and therefore they will be responsible for preparation of the required management plans for this proposal.
- All Management plans required for the proposed railway (Proposal 5) and railcar depot (Proposal 6) will be prepared by consultants engaged by the proponent, to the satisfaction of the Minister for the Environment.

1.5.4 A major review of the Metropolitan Regional Plan is necessary to address the consequences of the coming decline of oil, including future population growth in the city.

Forecasts of future population growth in Perth and associated implications are addressed in various regional structure plans and state planning strategies prepared by the WAPC. The proposed amendment is in accordance with the *North West Corridor Structure Plan* for the PMR. However, this issue is beyond the scope of this amendment to consider.

2. SUBMISSIONS ON PROPOSAL 1 OF THE AMENDMENT

Biophysical

2.1 Vegetation communities

2.1.1 The assertion that “Vegetation communities lost as a result of clearing for the proposed development are considered to be adequately represented in the adjacent Neerabup National Park” is disputed. The area is a juxtaposition of the Quindalup Dunes and the Spearwood Dunes and as such is significant for two reasons:

- i) there is an important junction/ interface between a large early Holocene parabolic dune; and
- ii) there is important soil contact that creates a vegetation transition, particularly in the invasion of grasstrees onto the calcareous soils of the Quindalup dunes that is not evident elsewhere on the Swan Coastal Plain.

The quoted statement is not made anywhere in the Environmental Review addressing Proposal 1. The only statements relating to representation similar to the above statement were based on a detailed analysis of vegetation types at the association level: *‘The flora and vegetation types removed by Urban zoning are mostly well represented in this proposed Parks and Recreation area at Mindarie in addition to other regional sites.’* (p3 of the Executive Summary). The other cited features of Holocene dune interfaces and vegetation interfaces are discussed at length in Sections 3.3, 3.4 and 5.4 of the Environmental Review.

2.1.2 How will the condition of the bushland proposed to be protected in a 120ha Parks and Recreation (P&R) reservation be maintained given that the proposed interface between this reserve and the urban zone is a long vulnerable boundary in relation to the size of the area? The boundary must be amended (by increasing the size of the P&R reserve) so the P&R reserve is a regularly shaped block.

The area to be retained at Mindarie for Parks and Recreation as a result of the amendment will be in excess of 120ha. With contiguous regional open space areas in adjoining P&R land and Public Open Space areas there will be a continuous area of 305ha to the west of Marmion Avenue at Mindarie. In effect the 120ha has already been increased, as this submission calls for, by 185ha as clearly shown in Figures 3.4 and 3.5 of the Proposal 1 Environmental Review. This concept was discussed at length in the Environmental Review for Proposal 1 (p27–29). Management of the Urban–P&R interface is discussed further in Response 2.1.6.

2.1.3 Clearing 170ha of Lot 2 Burns Beach for housing is totally unacceptable particularly given that 80% of this area is identified in draft *Perth's Bushplan* as regionally significant. The area contains a significant number of the Western Australian Christmas Tree (*Nuytsia floribunda*) which is parasitic, hence it cannot survive in isolation. How will it survive if a significant area of vegetation is cleared from Burns Beach?

The proposal addressed by the Environmental Review is the clearing of 110ha of land – not 170ha (p8 of the Environmental Review). The additional area that this submission includes in the total is not part of draft Perth's Bushplan site 322 as it has previously been approved for development by the Minister for the Environment. Furthermore, the draft Perth's Bushplan shows the proposal area as "Subject to Further Investigation" which reflects the uncertain significance of the vegetation within. The area of Bushplan site 322 is 487.8ha, as stated on page 25 of the Environmental Review. This means that the 110ha proposed for Urban zoning represents 23% of Bushplan site 322– not 80%.

With respect to *Nuytsia floribunda*, the species is hemiparasitic. This means it supplements its nutritional and water requirements via the attachment of haustoria to the root systems of other plants rather than being solely reliant on this source. In areas of the subject land where Spearwood vegetation is to be retained there is no reason to expect the species will not persist. In areas to be cleared, *N. floribunda* is likely to be removed also and the issue of survival in isolation will not arise.

However, many examples of healthy *N. floribunda* trees surviving in urban situations exist in Perth, for example Pomeroy Road in Kalamunda. Furthermore, the land owner proposes to include an additional 5ha portion of land for public open space. The position of this area may be designed to maximise retention of existing *N. floribunda* trees, subject to appropriate subdivision design. This form of development, coexisting with natural vegetation, is recommended by the responsible authority, however, the design of the development is ultimately determined by the developer and the Local Government.

2.1.4 Pt lot 2 is a rich tapestry of swales of vegetation of Parrot bush *Dryanda sessilis*, Candle *Banksia attenuata*, WA Christmas tree *Nuytsia floribunda* and Flame Banksia *Banksia menziesii*. In parts the shrubland is so thick with *Acacia rostellifera*(?) it's virtually impenetrable.

Agreed. The vegetation and species quoted were all clearly identified in the Environmental Review document as occurring in the subject land and their significance, wider occurrence and impact from the proposal documented.

2.1.5 How will the reservation of 120ha of land at Burns Beach for Parks and Recreation protect the conservation values of the area? The 120ha, and in fact the whole of Lot 2 Burns Beach, should be zoned as a Conservation Area to ensure the protection of the vegetation.

The MRS does not provide for the ‘zoning’ of conservation areas. The Parks and Recreation reserve is applied by the WAPC to protect significant areas and this brings with it a compensation or acquisition liability. Maintenance of conservation values within Parks and Recreation reserve areas is historically proven and consistent with the purpose of these reserves. Refer also response 2.1.2.

2.1.6 How will weed invasion, fires, feral animals, rubbish dumping and recreational activities (e.g. walking, cycling) be managed in the 120ha proposed for reservation as Parks and Recreation so that the remnant bushland does not suffer further degradation?

Two environmental management measures outlined in the Environmental Review are relevant to this submission. It is proposed that these will become formal requirements for development approval on the subject land (p29 of the Environmental Review). The land developer will be required to prepare an Urban Bushland Management Plan and provide fencing of the road boundary of the Urban-Parks and Recreation areas to the requirements of CALM in consultation with the City of Joondalup. The Urban Bushland Management Plan will address issues such as formalised access, track rationalisation, fire management, policing and inspection /maintenance activities, weed control, revegetation and feral fauna control. The plan will include integration of planning and environmental management with continuous bushland areas in adjacent crown reserves and P&R zoned land to the north. Active involvement of community groups or the formation of a bushland management organisation will also be investigated and developed as part of this process.

It should also be noted that Pt Lot 2 is currently subject to weed invasion (which is particularly substantial adjacent to the poor management boundary with the existing Burns townsite), fires (as in 1995), feral animals, rubbish dumping, and uncontrolled recreation activities (particularly four-wheel drive vehicle use). The conversion of this land to the management of the local authority or CALM, combined with the implementation of an Urban Bushland Management Plan, will provide the active management that the area is currently lacking.

2.1.7 Who will be responsible for ensuring that the Burns Beach bushland (which is proposed to be reserved as Parks and Recreation) is protected from impacts associated with the proposed adjacent urban development? A Bushland Conservation Body should be set up to manage the area to prevent weed invasion etc.

The land will ultimately fall under the management of either CALM or the local authority. The implementation and development of a management body will be investigated as part of the Urban Bushland Management Plan to be prepared by the land developer to the satisfaction of these authorities (refer Response 2.1.6).

2.1.8 Once destroyed, natural bushland ecosystems cannot be replaced. The value to society and future generations of these natural areas like Neerabup National Park and Burns Beach bushland is therefore priceless and should be recognised and respected by the planning authorities.

It is considered that the provision of 120ha of private land, at no cost to society, to a 305ha coastal reserve at Mindarie does constitute recognition of retention of these values for future generations. The wider planning view of the proposals in Clarkson-Butler increases this to a 475ha corridor of regional open space linking Neerabup National Park with the Burns Beach bushland area at Mindarie. Overall, the balance of social, economic and environmental factors achieved in the proposals in this amendment provides for a sustainable outcome.

2.1.9 The bushland at Lot 2 Burns Beach includes vegetation and landforms of the Quindalup and Spearwood dunes that are poorly represented in existing reserves.

The Clarkson-Butler amendment, including Proposal 1, will result in the establishment of an area of P&R or regional open space of Quindalup and Spearwood dunes in excess of 300ha. This rezoning will provide for the conservation of Quindalup and Spearwood dunes systems at Mindarie (Burns Beach). This is in addition to the 3,536ha of Quindalup and 5,205ha of Spearwood dunes currently on protected lands as defined by draft Perth's Bushplan (p12 of the Proposal 1 Environmental Review). See also response 1.1.4.

2.1.10 Large areas of *Banksia/Nuytsia floribunda* woodland will be lost to this development. This is an extremely species rich area worthy of protection.

The comprehensive flora survey of the site did not identify a vegetation unit of *Banksia/N. floribunda* woodland. *N. floribunda* occurred patchily in *Banksia* woodland associations on the subject land. Of this, 27.9ha will be removed by the Urban zone leaving 44.2ha reserved for Parks and Recreation in the Mindarie area alone (p19 of the Environmental Review). There are also additional areas of protected *Banksia* woodland further inland in the Neerabup National Park.

2.1.11 The dominant vegetation habitats developed in each of the five sectors identified by Searle & Semeniuk 1989 are distinct from adjoining sectors. Changes in dominant habitat types between the sectors and the climatic gradient along the coast interact to develop a heterogeneous distribution in the structure and floristics of the vegetation units at regional and large scales. At the local scale, vegetation also is strongly related to habitat features. Therefore as the habitats change so does vegetation structure and floristics. Within any given area there will be vegetation response due to factors such as distance from the ocean, soil development, position in the landscape and fire history. Furthermore, soil and landscape factors are also related to climate, and altogether produce distinct regional and local patterns in the vegetation of the Quindalup Dune systems (Proposal 1 & 2).

The above is a description of regional variation in the Quindalup system, so it is assumed that the above submission is intended to raise the issue of conservation of regional level variation in this context. This is addressed in Responses 1.1.4, 2.1.15 and 2.1.20.

It should also be acknowledged that the area of Lot 17 encompassing Proposal 2 is located entirely on the Spearwood Dune system and therefore the coastal studies of Searle and Semeniuk 1989 are not considered relevant to the assessment of this proposal.

2.1.12 The park proposed for Pt Lot 2 has no buffer and will therefore become a weed patch.

This comment appears to consider the 120ha in the Western cell of Lot 2 in isolation (refer Response 2.1.2). The entire Western Cell itself is only 290ha and there are substantial areas that are not 'weed patches' and this is without the benefit of the weed control measures and active management that will be developed as part of the Urban Bushland Management Plan (refer Response 2.1.6).

2.1.13 Aerial photographs and on-ground visits reveal the majority of the bushland to be in very good condition. The Banksia woodland is generally weed free. Parts of the strip are subject to *Pelargonium* invasion. Conservation priority must be given to areas of vegetation in good condition as they are most likely to have the greatest resilience.

Agreed. The above statements regarding vegetation condition and taking this into consideration in conservation space planning are already made in the Environmental Review :

“The condition of the vegetation of the study area is variable from dense and in very good condition to severely degraded (Halpern Glick Maunsell, 1995; Tingay and Associates, 1998a). In general it is in good condition and recovering well from the 1995 fire. However there is evidence of considerable degradation in the south-western portion of the area in the vicinity of the existing Burns Beach town site ...” (p13).

In addition, p15–17 of the Environmental Review outlined that the location of land proposed for P&R rezoning had been specifically intended to meet several criteria. These include maximising the retention of good condition Quindalup and Spearwood vegetation in P&R and maximising the use of degraded vegetation for development land.

2.1.14 A brief survey of Pt Lot 2 and 17 by Keighery (1991) found several flora species and plant communities considered significant because of their limited distribution or lack of representation in the conservation estate.

The study by Keighery (1991) was referenced several times in the Environmental Review, including in the comparative analyses of floristics (p20 of the Environmental Review). The species of interest found on the subject land were discussed at length on p31–33 of the Environmental Review, including consideration of their conservation status and appropriate management requirements.

2.1.15 Griffin (1993) documented heterogeneity and patterns of variation in the composition of the vegetation of the Quindalup dune system between the Swan and Irwin Rivers and found that variation in the coastal sector south of Lancelin was poorly represented in conservation reserves. It recommended protection of Lot 2 Burns and Lot 17. Similar recommendations can be found in Griffen and Trudgen (1994).

The recommendations of Griffin (1993) were specifically reproduced, along with a discussion of how the proposal meets them, in the Environmental Review document (p28). The relevant section from the Environmental Review is reproduced below:

‘...This outcome would also comply with the recommendations of Griffin (1993) with regards to the Mindarie area:

‘The Public Recreation Reserve at Mindarie (35890) should be enlarged to the east and south by the acquisition of privately owned land and be declared a Reserve for the Conservation of Flora and Recreation and vested in the Wanneroo City Council.’

Proposal 1, and the other components of the Clarkson - Butler amendment, achieve this objective as shown on Figures 3.4 and 3.5. Reserve 35890 would effectively be enlarged by 180ha (245%) to 307ha as an outcome of the amendment. This would comprise 125ha of the subject land to the south (an approximate doubling of the Reserve’s current size in itself) and 55ha to the east. The outcome is even superior to Griffin’s recommended scenario in one respect as ‘acquisition of private land’ will not be required to implement the recommendation.’

With respect to the recommendations of Griffin and Trudgen (1994), the proposed Parks and Recreation zoning, when considered in conjunction with the other contiguous open space areas to the north, will also meet the key recommendations of this study.

This will mean that the Parks and Recreation zoned land will provide for the retention of the majority or entirety BB4, BB6 and BB3 (part of) areas, as categorised by Griffin and Trudgen (1994), all of which were considered 'very important', and all of the BB2 area which was considered 'important'. The BB1 area which these authors considered 'not important' will largely be removed by the Urban zone (refer p55 of Griffin and Trudgen (1994)). Their relevant general recommendation (number 9 of this study – p4 of Griffin and Trudgen (1994)), was:

“A conservation reserve based on reserve 35890 and the Burns Beach property should be created to protect the values in these areas for the conservation of vegetation and flora. This would also protect a range of landforms.”

As outlined above in response to the recommendation of Griffin (1993), this is effectively what will arise from the Clarkson–Butler Amendment, with a 305ha regional open space created based on reserve 35890 and the Burns Beach Property (the subject land of Proposal 1).

2.1.16 It is understood that *Alyogyne huegelii* var. *glaresecens* occurs north of Burns Beach townsite in the proposed development area. Another stand has been seen further north on the dune ridges also. What is the distribution of this variant? Do the Burns Beach populations occur at or near the ends of its distribution? The conservation status of this species should be considered.

The conservation status of this species was considered in the Environmental Review document. It is discussed on p31-32 of the Environmental Review, which notes that the variant is not regarded by CALM as a priority species. This discussion also identifies the local abundance and distribution of the variant and comments on its documented regional occurrence. The responsible authority will require the land developer to complete a detailed survey of all flora species of significance and prepare a management plan to CALM's satisfaction. Given that the *A. huegelii* variant is not a priority listed species, it is considered that this constitutes an appropriate level of consideration.

2.1.17 Only 12 of the 435 species recorded in the study area are recorded at all sites. This shows how diverse and unique the flora is.

As was pointed out in the Environmental Review document, a range of uncontrolled differences exist between the study sites (sampling season, inter- and intra-observer variation, survey effort), in addition to the varying representation of Quindalup and Spearwood vegetation units in the study areas. This means that the conclusions drawn on the basis of the analysis should not be regarded as authoritative, when it represents an uncontrolled comparison that is likely to be confounded by a number of factors.

Despite this, a low proportion of species only occurring on all sites is an expected outcome. Given that one of the sites (Lot 17) is largely Spearwood associations, and the balance of the area predominantly Quindalup, it is in keeping with expectations that relatively few species would be recorded from all study areas. The finding is also in accordance with the fundamental nature of ecological communities as pointed out in the Environmental Review (p21) that numerous species are of low frequency in the natural situation (rare) and that relatively few are common. The Quindalup vegetation complex also exhibits regional shifts in floristic composition (Cresswell and Bridgewater, 1985; Griffin, 1993), so some of the inter-site variation is also likely to be attributable to this phenomenon.

2.1.18 The Environmental Review states on page 52 that “large tracts of Quindalup Dunes are... over run by the introduced species *Pelargonium capitatum*” This is absolutely false, there are small areas of this weed present along with many native species.

The part of the subject land referred to in the section of the Environmental Review that the submission quotes from is the south-western portion of the cell (as clearly stated on p52 above the quoted comment). The submitter is claiming that the assessments of this area by Malcolm Trudgen, Ted Griffin and Dr. Paul van der Moezel, some of this state’s foremost botanists, are ‘absolutely false’. It is considered that the assessment of this south-west portion of the cell as presented in the Environmental Review is entirely valid and that these areas are severely degraded by *P. capitatum*.

2.1.19 M. Donnelly (Submitter no 326) has completed a flora list from observations over the last two months. He records an additional 48 flora species, which when added to the 191 present in the Environmental Review list achieves a total of 239 species in the subject land. Therefore Pt Lot 2 exceeds Alkimos and all other surveyed locations in terms of floral diversity. There are also 18 more species he was unable to identify. Consequently he considers the survey presented in the Environmental Review is inadequate and was not completed by experienced personnel.

The flora survey referred to as 'inadequate and completed by inexperienced personnel' was conducted by Dr. Paul van der Moezel, one of the state's most experienced and respected botanists. The claimed species list is uncorroborated and the botanical expertise of the submitter unknown. There is no objective evidence to suggest the flora survey is not adequate.

2.1.20 If roughly half of the floral species in Pt Lot 2 are absent from each of the other areas surveyed, how can the conclusion be drawn that the bushland lost is well represented in other areas?

As stated on p22 of the Environmental Review, 134 species (70%) of the subject land's flora is represented at Alkimos and 116 species (61%) occur at Eglinton. These sites are in a regional context. Locally, it was identified several times in the Environmental Review that the large majority of the flora species occurring in the proposed Urban zone are represented in the land to be rezoned to Parks and Recreation at Mindarie (Burns Beach). An analysis of the vegetation units to be removed compared to those to be retained at Mindarie identified that 64ha of the same Quindalup units and 116ha of the same Spearwood units to be removed by urban development would be retained locally. This was the basis for the statement '*...whilst they may be reduced locally within the subject land, they are well represented by large areas in the Mindarie open space to be formed by Parks and Recreation zoned land...*' in the Environmental Review (p19) – not the floristic variation analysis. Refer Response 2.1.17 for a more general discussion of the issue of the floristic site comparison carried out in the Environmental Review.

2.1.21 Is it acceptable for bushland to be destroyed that contains 34 species not found in any of the other areas surveyed? Is it acceptable to destroy bushland that has more than double the number of species, relative to area, than any other comparable land?

The first question in this submission contains a statement that is incorrect. There were only 22 species recorded from the subject land (p21 of the Environmental Review). Of these, 8 were weeds and are therefore not of significance. The 14 species remaining may not have been recorded in the other sites considered in the Environmental Review, but this does not mean they occur only in the subject land. Most of the species, including *Lepidosperma leptostachyum*, *Schoenus latitans*, *Podotheca chrysantha*, *Poranthera microphylla*, *Calothamnus sanguineus*, *Corymbia calophylla*, *Comesperma confertum*, *Samolus repens* and *Stylidium repens*, are generally regarded as widespread and have distributions that extend from Kalbarri to Augusta and beyond (Marchant *et al.*, 1984).

How is it concluded that the subject land has double the species richness relative to area compared to other similar sites? If the data in Table 3.4 of the Environmental Review (p20) are considered, one would arrive at the

conclusion that the Quinns Rocks study area is by far the most species rich for relative area, with 113 species in an area less than one tenth the subject land (a species to area ratio of 4.5 spp/ha compared to 0.7 for the subject land). The accumulation of additional species is typically asymptotic with increasing sampling area within a site. This means that it is difficult to compare species richness on a quantitative area basis unless a standardised study of the same sampling areas and efforts is carried out.

2.1.22 The Environmental Review document fails to directly address many of the stated EPA objectives and no new data is presented which supports a change in the EPA's conclusions reached in Bulletin 880. The area has still not been adequately surveyed for flora and vegetation. The assessment so far has been limited to dominants and a limited appraisal of rare and priority species. This survey work needs to be undertaken before any decisions are made regarding boundaries.

Disagree. The Environmental Review contains a 13 page analysis of vegetation and flora issues (plus a 5 page data appendix). In addition, a comprehensive field survey was undertaken and carried out by a recognised botanist (refer Response 2.1.19), the results of which is comparable to surveys of similar sites by Trudgen and Keighery. It is therefore considered that the survey work carried out is of sufficient detail to address the EPA's requirements for the Environmental Review and to provide for land use boundary planning.

2.1.23 The criteria used to determine the Urban - Parks and recreation boundary are not provided in the Environmental Review and therefore the suitability of the boundary cannot be individually assessed (CALM).

The seven criteria applied in the development of the proposed land zoning boundaries were discussed at length on p16-18 of the Proposal 1 Environmental Review. Briefly, these were preservation of good condition Quindalup vegetation, Spearwood dune vegetation, the Spearwood-Quindalup interface and locally significant vegetation types; maximising development in degraded areas; minimising fragmentation and maximising links with other areas of remnant bushland.

2.1.24 The lineal configuration of the urban land results in a large edge to area ratio which creates a difficult management boundary for conservation purposes. CALM are prepared to provide advice regarding boundary definition to maximise viability of retained vegetation (CALM).

Noted. The lineal configuration of the land proposed for Parks and Recreation arises from two main considerations:

- **The need to accommodate undulating dune land forms in the interface between land use zones**

- **The requirement to provide for a coastal setback strip and corridor along the western margin of the subject land.**

The other requirements cited in Response 2.1.23, particularly the need to provide for a substantial portion of Spearwood dunes and the Spearwood-Quindalup interface, also constrained the configuration of the open space zone. There will be some opportunity for localised modification of boundary interface treatments in the final design of this interface and CALM will be consulted and involved in this process.

2.1.25 The bushland areas have significant natural heritage values, including historic, aesthetic, cultural, scientific and educational values.

Refer response 1.1.2

2.2 System 6/ Bushplan

2.2.1 The proposed protection of approximately 120ha of bushland at Burns Beach for conservation purposes will provide an ecological link to Neerabup National Park via Tamala Park. This link could also be used to establish the proposed Mindarie Regional Park.

Agreed. This concept is discussed in the Environmental Review in Section 3.4.

2.2.2 The proposed protection of approximately 120ha of bushland at Burns Beach might not be possible if the landowners did not donate the land as the Government would have to find the funds to purchase the land for conservation purposes.

Agreed. Given the potential value of the land and the budget that the Government has indicated is available for Perth's Bushplan, this statement is likely to be true.

2.2.3 What is the justification for a 120ha conservation reserve at Burns Beach? There appears to be very limited environmental justification for this scale of preservation.

The Burns Beach land has been identified as having a range of environmental values as detailed in the Environmental Review. The provision of 120ha for these values was considered to be an appropriate contribution to the preservation of these features at Mindarie.

2.2.4 The proposed development at Burns Beach will encompass the provision of conservation reserves and parks (120ha for Parks and Recreation, 5ha for conservation and 10.9ha for parkland) which will cover more than 42% of the total Burns Beach area.

Agreed. This concept is discussed in the Environmental Review in Section 3.4.

2.2.5 Why has the Government changed its mind on preserving the whole of the Burns Beach area as a Bushland Park? Where is the justification? The rezoning of Burns Beach to urban ignores the environmental review in Bulletin 880 of the Environmental Protection Authority. This is most disappointing as Lot 2 Burns Beach represents the only sizeable area of coastal bushland from Wilbinga to Rockingham, coastal vegetation (particularly coastal heathlands and Banksia woodland) in the northwest corridor is very poorly protected and the Burns Beach area features a significant cusped foredune. A comprehensive, independent flora survey should be commissioned before any development takes place.

The Government has not changed its mind in relation to the subject land. Bulletin 880 as referred to by this submitter constitutes the view of the EPA, which is an independent advisory body to Government and can consider environmental issues only. It is the role of Government, via the appropriate Ministers, to act on this advice in the context of other relevant considerations to determine the appropriate direction for land planning to proceed. In doing so, the Minister for the Environment clearly identified that the current environmental assessment process may present a mechanism to consider land use planning for the balance of the subject land. This is explained on p3 of the Environmental Review. Therefore the Government has not changed its position as suggested, but merely followed the formal process it previously identified to resolve the competing land use issues for the Western Cell of Lot 2 Burns Beach.

A comprehensive flora survey has already been carried out by a very experienced botanist (refer Response 2.1.19).

2.2.6 The land should be rezoned for Parks and Recreation and not be available for development to ensure conservation of the environmental values of the site.

120ha of the land in question will be reserved for Parks and Recreation (P&R). This is in addition to the 5ha of adjoining bushland proposed for Public Open Space within the Urban zone and the adjoining 180ha to the north in Crown Reserves and other land reserved for P&R (refer p27 of the Environmental Review). This will provide for a total of 305ha of reserved land to the west of Marmion Avenue at Mindarie which is greater than the size of the entire Western Cell of Lot 2.

2.2.7 System 6 Areas M2 and M6 were recommended for reservation because they contain vegetation and landforms which were identified as regionally significant and therefore has conservation value.

There is no mention of landforms in the original System 6 Report for the portions of the subject land relevant to M2 and M6 (DCE, 1983). The reason for the positioning of the boundaries within the subject land are unclear but it is likely that they did relate to vegetation and landform considerations. In any event, Proposal 1 will provide for 125ha of regional open space within the subject land, which is 20ha more than the System 6 recommendations provided for. This will include 70ha of the original System 6 areas, with the other 30ha having been passed over given that *'the revised boundary planning for urban and conservation space within the cell has favoured other criteria, such as the dune system interface and the significance of the Spearwood system, over this area'* (p25 of the Environmental Review).

2.2.8 Agree with EPA that the development proposal is environmentally unacceptable as the subject area has been recognised as having conservation value with part of the land covered by System 6 recommendations and is Bushplan Site 322.

Refer to Response 2.2.7 for a discussion of System 6 and Bushplan.

With respect to Bushplan Site 322, the portion that comprises the subject land is clearly identified in draft Perth's Bushplan as 'Subject to further investigation'. As identified in the Environmental Review, the portion of Bushplan Site 322 that is within the subject land was identified in the draft Perth's Bushplan as follows *'The most appropriate mechanism for the protection of this Bushplan Site (No. 322) to be considered through the public comment period in consultation with the land owners.'* (the Burns Beach Property Trust).

The negotiated outcome that is offered by the land owners is presented in detail in the Environmental Review document with a discussion of its impacts and benefits on p25-29. The outcome of the amendment for the portion of Draft Site 322 within the subject land can be summarised as:

'Whilst it is recognised that the 125ha provided for conservation purposes is less than that previously identified by the Government of Western Australia (1998) for draft Site 322, it must also be recognised that a 'negotiated' outcome by necessity involves a trade-off and balance of competing land use issues, environmental and economic values. The proposal presented still substantially achieves all of the environmental objectives to practicable levels - and does so at no cost to the community.'

The implementation of the draft site in this form will result in 305ha of continuous Parks and Recreation reserved land at Mindarie which will be available for reservation as a *'National Park, Conservation Park, Nature Reserve or Regional Park'* consistent with the other Draft Bushplan recommendations for this site. Together with the adjoining Bushplan Site 323, this would result in a northern coastal dune park containing a similar amount of remnant vegetation to Bold Park (~340 ha of remnant vegetation to be retained at Mindarie compared to ~362 ha in Bold Park).

2.2.9 The compromise deal, where some land is reserved for Parks and Recreation and the remainder zoned Urban proposed, is unacceptable. It would provide a less than adequate and representative conservation reserve than what is needed and also sets an unacceptable precedent for Bushplan sites.

Refer Response 2.2.8 for a discussion of Perth's Bushplan and the proposed negotiated outcome. The case of the subject land will not set a precedent as suggested. Negotiated planning solutions are one of the implementation mechanisms for Perth's Bushplan. This proposal uses this mechanism and is therefore consistent with the established framework.

2.2.10 The area should be secured as part of efforts to establish an adequate and representative set of bush reserves which will help conserve Perth's biological diversity.

Refer Response 2.2.8.

2.2.11 The proposed green belt linking the coast with Neerabup National Park is supported (DRD).

Agreed.

2.2.12 Too much bushland has already been lost through urban sprawl.

Refer Response 1.1.2 and 1.1.3.

2.2.13 Perth needs a major northern conservation Park.

Proposal 1 allows for and promotes exactly this concept as shown in Figure 3.5 in the Environmental Review. The implementation of this proposal will add to the several large conservation Parks that already exist in Perth's northern Metropolitan area, including Neerabup National Park, Yanchep National Park, Whiteman Park and Yellagonga Regional Park. The planned Gnangara Park will further expand the representation of conservation zoned land in the northern metropolitan region.

2.2.14 Why not reserve the whole of Lot 2 Burns Beach for Parks and Recreation? The whole area of bushland should be protected to create a major conservation park on Perth's northern coast. This is the last opportunity to retain a viable area for the long term and it should be linked east-west with all remaining bushland in Lot 17 Mindarie to Neerabup National Park. The land should be purchased by the State Government and made into an "A" class reserve (Proposal 1).

To reserve the whole of Pt Lot 2 for Parks and Recreation the Government would have to purchase the land. If this was done, the Government would have to expend a substantial portion of the funds that it has indicated are available for the implementation of Bushplan for the entire metropolitan region. Whilst the actual financial value of the land is open to debate, current valuations indicate that this could represent in excess of a third of the entire Bushplan 10 year budget. It would seem irresponsible for the Government to allocate such a major portion of the funding to a single site when there are numerous, more important, privately owned areas of remnant bushland that have been identified in the Draft Bushplan. This is particularly so when a negotiated outcome is offered that effectively presents the opportunity to secure 125ha of regionally significant vegetation without requiring any of the Bushplan land acquisition budget (refer also Responses 2.2.7 and 2.2.13).

2.2.15 The whole of Perth's Bushplan site No 322 should be protected into perpetuity for protection of its natural landforms, flora, fauna, landscape and ecosystem values.

Refer Response 2.2.14.

2.2.16 This is our opportunity to 'think global and act local'. Place the whole of Pt Lot 2 Burns under the protection of an appropriate authority.

Refer Response 2.2.14.

2.2.17 The EPA erred in its judgement by recommending the development of 55 ha proceed. The reversal of that decision is supported.

Formal approval has already been issued by the Minister for the Environment for the development of 55ha to proceed as an outcome of the previous PER process. This is not open to re-evaluation as part of the current Environmental Review assessment of the balance of the Western Cell of Lot 2.

2.2.18 This is the last large area of coastal vegetation that can be set aside in the Perth metropolitan area which can be set aside for conservation and heritage values. It is an environmental imperative that larger reserves are set aside. They have a unique role in preserving functioning ecosystem. Smaller, fragmented reserves, which may none the less have local importance, are not self sustaining.

Refer Response 2.2.7.

2.2.19 With the continuing expansion of the northern suburbs the value of native woodland will only increase. Consider the value of reserves such as Kings and Bold Parks to the community. Kings Park was created with vision for future generations, while future West Australians benefit from rooftops from Busselton to Geraldton.

Refer Response 2.2.7 and 2.2.8 and 3.2.25

2.2.20 There is an obligation on behalf of all Government departments to protect sites recognised under Bushplan. The loss of 115ha of a Bushplan site is totally unacceptable and makes a mockery of the entire Bushplan process.

Unlike other sites identified in draft Perth's Bushplan, the Proposal 1 area was indicated to be 'Subject to further investigation'. This suggests that its inclusion in Bushplan is not a foregone conclusion. Bushplan site boundaries are still being finalised. Negotiation with land owners for private lands affected by Bushplan and modification of boundaries to recognise other competing land uses will influence the final form of many Bushplan sites.

2.2.21 The proposed rezoning would result in an unacceptable further reduction in biodiversity on the Swan Coastal Plain. The Government has stated in its response to the State of the Environment report that it is committed to implementing a Biodiversity Conservation Strategy. To clear a Bushplan site is in direct contradiction to such a strategy.

Even with a comprehensive, fully referenced analysis of available information (refer to Proposal 1 Environmental Review), definitive statements relating to the impact of the proposal on biodiversity of flora and fauna can not be made. None of the species recorded are restricted to the areas proposed for Urban zoning and with the reservation of 305ha of the same vegetation units at Mindarie, the risk of any local species loss or reduction in biodiversity will be minimised. With respect to the final comment in this submission, the draft Perth's Bushplan site in question was identified as a special case 'subject to further investigation' (refer Responses 2.2.7 and 2.2.8).

2.2.22 There is a high level of community interest and support for the retention of this bushland

This is clear from the extent of submissions received. It is considered that this proposal makes a substantial contribution to the community by providing for a 125ha contribution of bushland to a 305ha Mindarie regional open space without requiring the expenditure of any community funds. Refer to response 2.2.14.

2.2.23 Five independent scientific studies of the area has been strongly in the favour of retaining Lot 2 Burns Beach and Lot 17 as natural areas in their entirety (Proposal 1 & 2):

- a) Semeniuk et al 1989
- b) V & C Semeniuk Research Group 1989

- c) System 6 Conservation Reserves by the Environmental Protection Authority
- d) Draft Perth's Bushplan 1999
- e) Hames Sharley Australia 1992

The findings and recommendations of all of these studies were referred to, discussed and evaluated in the context of the proposal in the Environmental Review document. These studies have also been discussed further in individual responses in these responses to submissions. These are summarised in the table below.

Study	Addressed in ER	Other relevant responses
Semeniuk et al 1989	Section 5.4.2	2.4.2-2.4.4
V & C Semeniuk Research Group 1989	Section 5.4.2	2.4.2-2.4.4
System 6	Section 3.4.2	2.2.7
Draft Perth's Bushplan 1999	Section 3.4.2	2.2.8
Hames Sharley Australia 1992	Section 5.3.2	2.5.2, 2.5.6

In each case, an account has been provided recognising the findings of the study and how they have been implemented in Proposal 1.

The proposed urban development of the northern portion of Lot 17 (Proposal 2) has been a long-term objective of the landowners in conjunction with planning strategies prepared by the former State Planning Commission in 1988 and the City of Wanneroo for the overall Clarkson-Butler area. The northern portion of Lot 17 is not constrained by environmental issues, namely System 6 recommendations and more recently Bushplan. System 6 and Bushplan, did however, recognise the importance of maintaining an east-west link between the coast and Neerabup National Park. This has been addressed in the Amendment through the proposed reservation of part of Lot 17 surrounding the Tamala Park facility. Additionally, the rehabilitation of the southern area of Lot 17 following the closure of the refuse disposal site is a requirement of the operation of the site.

2.2.24 The proposal will create a large edge with urban development interfacing the bushland retained. Pressures on the bushland would include:

- a) wildlife predation by pets;
- b) recreational pressure;
- c) potential for rubbish dumping and fire lighting.

These pressures would be reduced by a greater conservation area.

Refer Response 2.1.6 and 2.1.7.

2.3 Terrestrial fauna

2.3.1 Pt Lot 2 supports many bird species and resident confirms kangaroos live in the bushland.

The presence of 41 birds species and the Western Grey Kangaroo was identified as an outcome of the fauna survey undertaken of the site and documented and discussed in the Environmental Review in Section 4.0. The amendment will provide for the retention of 305ha of fauna habitat for these species at Mindarie.

2.3.2 Practical management of Pt lot 2 Burns is made difficult when housing along with its house pets is allowed. Until the Joondalup City Council addresses the pressure on native wildlife, cats will have free reign. The only saving feature is the ratio of cats to hectares. If that ratio tips against the local fauna the results are self evident.

Agreed. Refer Response 2.3.3.

2.3.3 No mention has been made that within the development there will be a ban on cats. With small mammal species already under threat and poorly represented in the area, an increase in domestic cats will decimate any small mammal populations.

It is agreed that domestic cats have an impact on small fauna species in nearby habitat areas, however, this is a matter for local government in consultation with the community rather than the WAPC.

2.3.4 The fauna surveys undertaken are still inadequate. No comprehensive faunal survey has been done of the area. Many of the small native animals are nocturnal, and studies of these are incomplete. Also successive fauna surveys may not detect species because they have been present in very low numbers.

It is recognised that the fauna survey work constitutes a single sampling exercise and may have missed species as a result (this was noted on p36 of the Environmental Review). However, the assessment as carried out at present can only operate on the basis of the available data. In recognition that this might not represent a complete appraisal, a list of species that may occur in the area but were not recorded was compiled (Appendix D of the Environmental Review), and any significant species discussed (p46-47 of the Environmental Review). Management measures to address the known or suspected presence of priority fauna will also be required as a condition of development approval in the proposed urban zone.

2.3.5 The intense bushfire in 1995 may have suppressed the fauna populations present for some years, making it seem less species rich than normal.

This may be true and the potential effects of the fire on the fauna and the outcomes of the fauna survey were discussed in the Environmental Review (p41). Refer Response 2.4.5 for a discussion of the approach to possible deficiencies in the available data.

2.3.6 All the Banksia woodland in this development would be lost. This effectively removes a large food supply for small native mammals such as *Tarsipes rostratus*, and severely restricts bushland corridors.

Disagree that all Banksia woodland will be lost. As detailed on p41 of the fauna section of the Environmental Review, 44ha of Banksia woodland will be retained in the land reserved for Parks and Recreation at Mindarie. Furthermore, provision for 'bushland corridors' was one of the key considerations in positioning the open space land (p18 of the Environmental Review). The issue of 'bushland corridors' in the context of this proposal was also discussed at length on p43.

2.3.7 Local observations of wrens and Red Wattlebirds. Jewel beetles are present and Grey kangaroos are fantastic to see from the beach. Native mammals could be reintroduced to this area and used as a tourist attraction.

Refer Response 2.4.1. The amendment will allow for the implementation of a 475ha coastal regional park at Mindarie (refer Response 1.3.1), which would enable any such opportunities to be pursued.

2.3.8 If we have animals that can be described as relatively common then we should be doing everything we possibly can to ensure that their status is maintained.

Refer Response 1.3.1.

2.3.9 The linkages between reserves help fauna populations survive in the longer term because of the availability of a variety of habitats and refuges.

Agreed. This principle is promoted in the Environmental Review with the situation of P&R conservation space such that it is continuous with open space to the north and provides what corridor functions can still be achieved to the east of the subject land (see p43 of the Environmental Review). Refer Responses 1.3.1 and 2.3.6.

2.3.10 Pt Lot 2 represents an opportunity to retain a large habitat remnant to support some faunal assemblages of the relatively species rich Quindalup and Spearwood dune systems which are poorly conserved (How and Dell 1993, 1994 note the diversity of

reptile fauna in the near coastal dunes on the Swan Coastal Plain and the need for greater representation of these areas in the conservation estate in order to more adequately protect the fauna).

The How and Dell studies are discussed at length in the Environmental Review including an analysis of the issue of relative species diversity in dunal systems (refer p39–42). The amendment makes provision for the reservation of 305ha of Quindalup and Spearwood habitat at Mindarie for Parks and Recreation as outlined in Response 2.3.6.

2.3.11 The survey of fauna did not include Splendid Fairy Wrens which do visit Burns residents gardens.

Splendid Fairy Wrens were recorded in the survey and are specifically mentioned on p39 of the Environmental Review.

2.3.12 The Black Cockatoos that visit may not breed here but they rely on this bushland as major food source visiting around the months of December onwards to rebuild their strength and feed their young. (Proposal 1)

The proposal will result in the preservation of 228ha of proteaceous woodlands and heaths to provide feeding resources for vagrant and migrant Black Cockatoos that visit the site.

2.4 Landform

2.4.1 The cusplate foreland and its internal array of landforms and vegetation is the last most intact landform remaining and is not adequately secured in the conservation estate. The development will affect a significant part of the Burns Beach cusplate foreland, a globally significant landform feature.

To claim that the Burns Beach cusplate foreland is ‘globally significant’ is an exaggeration. In any event, the amendment will result in the retention of 280ha of Holocene dune landforms in Parks and Recreation reserved land at the Mindarie cusplate foreland. This will include the parabolic dune rim within the subject land, a major blowout formation, the coastal expression of the cusplate foreland and a perched Holocene dunefield – all of the attributes for which the Mindarie area is ascribed landform value. This provides for an appropriate balance of conservation with other competing land uses in the local area.

2.4.2 The Environmental Review cites the Quindalup Dunes Regional System Study (Semenuk *et al* 1989) and the Environmental Audit of the North-west corridor (V & C Semenuk) document but does not mention specifically the importance these studies place on the area or indicate its rarity.

The Environmental Review (p55) states: *'However, this landform is not considered to be well conserved in existing reserves (V and C Semeniuk Research Group, 1991).'* It is partially in recognition of the importance that previous studies have placed on this area that the 475ha regional open space (including 280ha of Quindalup dune landforms) will be provided for at Mindarie as an outcome of the amendment (refer Response 2.4.1).

2.4.3 According to Semeniuk *et al* 1989, the cusplate foreland of this section of the coast is the sole representative of this landform in what is classified as the Sector Four classification of the five sector Quindalup Dune representations, extending from Geographe Bay sector in the south to the Wedge Island-Dongara sector in the north. The only other representation that existed in the Sector four classification was the Sorrento cusplate foreland which has since been developed. As such this area should have a large buffer zone, the amendment proposal provides insufficient buffer.

Disagree that Semeniuk *et al.* (1989) find that the Mindarie cusplate foreland is 'the sole representative of this landform...' in coastal section 4 (Whitfords to Lancelin), as the text actually notes that there are no examples of accretionary cusps conserved from Sector 4 (Table 5 of Semeniuk *et al.* (1989)). The majority of the accretionary cusp, and its associated Holocene dunefield (280ha) will be retained at Mindarie and reserved as Parks and Recreation. This will be in addition to other cusp formations in the same coastal Sector at Alkimos, Wilbinga and Ledge Point (p57 of the Environmental Review) (see also Response 2.4.1).

2.4.4 Semeniuk *et al* 1989 states that the coastal evolutionary processes of Sectors 2, 3 and 4 are markedly different. Sector 4 contains slowly eroding limestone shores and associated pocket beaches, together with the local sedimentary cusplate accumulation in the energy shadow of offshore islands/reefs, and presents yet another suite of coastal landforms determined by the processes operating in that sector. Even if a given landform may occur in several sectors, its dynamic morphology may vary regionally. In terms of landform complexity and heterogeneity, the Quindalup Dunes of Sectors 4 and 5 exhibit most variability. There are cusps, perched dunes, parabolics, blowouts, beachridge plains, chaots etc., within Sector 4 continuing a predominance of fixed parabolic forms Sector 5 contains a proportion of active and relict parabolic dunes.

It is agreed that the geomorphic nature of cusplate forelands and associated formations vary from sector to sector. However, as noted in Response 2.4.1, 280ha of the Holocene dunes backing the cusplate foreland at Mindarie will be set aside for conservation within Sector 4 of the coast. There are also additional opportunities to conserve accretionary cusp formations at Alkimos, Wilbinga and Ledge Point which are within the same coastal sector (p57 of the Environmental Review).

2.4.5 While various reserves have been established for preservation of rare flora and fauna, specific landscape ecology and scientifically interesting geological features, there is inadequate conservation of the variety of geomorphic, habitat and vegetation systems in the Quindalup Dunes. Where reserves are present in the Quindalup Dunes in the Perth Metropolitan Area there has been a tendency to undue emphasis in preserving the more seaward assemblages at the expense of the more landward assemblages. In the Whitfords-Lancelin coastal sector there are no examples of perched dunes and accretionary cusps conserved (Semeniuk 1985).

Refer Responses 2.4.1, 2.4.3 and 2.4.4.

2.4.6 The blowout formations should not be considered to have no value. There is a possibility that these formations will stabilise and will be colonised by indigenous plants. In any case, they are part of the natural landform processes and should not be destroyed.

The blowouts are considered currently to have negligible ecological value. This is still considered to be a valid analysis. The current assessment is evaluating environmental and other planning imperatives on the subject land that are of considerable significance, and therefore it is considered that it is not realistic to give such weighting to an opinion that 'a possibility' of stabilisation exists. This is particularly so when one considers that another far more developed and extensive blowout formation will be retained in the immediate area for retention of landform process.

2.4.7 Pt lot 2 has considerable conservation value as it:

- a) preserves a relatively undisturbed distinct large-scale coastal landform, with a complex internal assemblage of smaller scale landforms and habitats, and associated vegetation assemblages not represented elsewhere within this coastal sector (advice from Dr V. Semeniuk 1996);
- b) provides a record of past and continuing climatic, coastal and landform processes and so has scientific value and forms part of our landscape heritage; and
- c) is an example of cusped forelands which have developed on the western coast of a continent, a phenomenon which only occurs in south-western Australia and reflects the geological and climatic history and landform evolution of the region (comments made by Dr V Semeniuk, 8 December 1999). It is unique as an intact example of this landform feature.

Several submissions raise the question of the scale of consideration to be adopted in conserving landform features. The proposed rezoning and reservation adopt a realistic and reasonable level of distinction in identifying the various types of Holocene dune formations present within the Quindalup Dune System at Mindarie and other coastal sectors. They do not descend to the level of distinguishing individual dunes as significant on the basis of variations in internal small scale assemblages or minor variations in climatic history as

suggested above. This level of variation is so fine that it is likely to be appreciated by only a small sector of the scientific community and would have little importance to the community as a whole. This is particularly so when the same small sector of the community is calling on the Government to expend large sums of public money on acquiring land for these values when a reserve of 260ha of Holocene dune formations could be established at Mindarie with no requirement for community funds (refer Response 2.4.1). Other public submissions raise the question of just how often the area would be visited to appreciate geomorphic values if the entire area was conserved (refer response 2.6.4).

2.4.8 The southern blowout proposed to be developed is significant as part of the cusate foreland. The proximity of the blowout to the larger northern blowout and differences between the two (noted in Griffin and Trudgen 1994) add to its conservation value.

As outlined in the Environmental Review, there are considerable pressures from competing land uses and a range of environmental considerations on the subject land. In recognition of the Griffin and Trudgen (1994) study, a detailed geographic information system (GIS) based analysis of historical aerial photography was undertaken of the blowouts to compare their developmental histories. This was a far more sophisticated exercise than those previously carried out and the results of this were documented in the Environmental Review (p50; 58-59). The findings are reproduced below:

'Griffin and Trudgen (1994) identified the southern blowout as differing from the northern on a variety of details and that both therefore warranted conserving. Some of the differences cited were in relation to the extent of vegetation colonisation (proportion of unstable surface) and the proportion of the perimeter still actively engulfing feature inland. However, from the GIS exercise conducted on historical photography, it appears that both major blowout formations have been relatively stable over time (see Figure 5.3). Both have a relatively small proportion of their inland margins still mobile and these areas are often where tracks appear to have enhanced erosional processes.

Both the smaller blowout in the subject land and the larger to the north at Mindarie have shown noticeable vegetation colonisation over time (see Figures 5.1 and 5.3), and this vegetation was identified as the same type in both formations (Griffin and Trudgen, 1994). Both blowouts also have a redeveloped foredune closing off the throat of the formations (Griffin and Trudgen, 1994). The lower formation is more colonised and has a slightly less flattened cross-section, possibly indicating that it is at a more advanced stage of its evolution than the northern formation (Griffin and Trudgen, 1994). However, considering the similarities noted by Griffin and Trudgen (1994) and the outcomes of the GIS analysis, the northern formation appears to be very similar to the southern, albeit larger and not as fully developed. Given the other environmental, planning and financial imperatives on the land (discussed at length in Sections 3.0 and 4.0), the preservation of one of these blowouts

for scientific interest at Mindarie, with its associated Q3 and Q4 dunes, should be regarded as a representative contribution for the locality.'

This position is a realistic one to adopt, based on detailed investigation, and this submission provides nothing additional to support the claim that the southern blowout warrants conservation in addition to the northern.

2.5 Coast

2.5.1 The expansion of the Burns Beach foreshore by 100 - 200m will assist in the protection of the sand dunes and minimise wind erosion.

Agreed.

2.5.2 Trudgen (1996) says "It is remarkably short sighted that the strip is so narrow" reacting to the width of the coastal reserve south of Burns Beach which is approximately 250m and rises to 400m. Trudgen is unlikely to support the 100m proposed.

The coastal reserve proposed is in excess of 100m, as stated in the Environmental Review (p51-52). The reserve width will vary from a minimum of 100m (in the degraded south-western section of the cell) up to 170m (averaging 140m wide). This was based on the recommendations of Hames Sharley (1992), a comprehensive regional analysis of coastal reserve requirements and site specific recommendations, and is consistent with WAPC guiding policies. A detailed account of the criteria applied to the development of the foreshore reserve width is provided on p51-53 of the Environmental Review.

2.5.3 There should be a 1000m foreshore zone before even considering any development.

Given the fact that the subject land is privately owned and has a range of planning and competing land-use imperatives upon it, this comment is clearly an unrealistic expectation and is unsubstantiated. Refer Response 2.5.2.

2.5.4 The Urban Bushland Council does not support urban development within 500m of the high water mark.

Refer Response 2.5.2.

2.5.5 The design of the proposed urban development at Burns Beach should include provision for some beach front apartments for itinerant holiday use and significant car parking should be provided along the foreshore to provide public access to the beach at strategic points.

The specific details of the final uses within the urban zoned land will be the subject of future discussions between the land owners and the relevant planning authorities. However, there will certainly be provision of controlled public access and appropriate capacity and designed car park facilities.

2.5.6 Hames Sharley Australia (1992), in their Coastal Planning Study - Burns Beach to Jindalee Technical Report, recommended the westward margin of the Tamala limestone as being an important criterion in determining coastal setback width in this area.

This finding of the Hames Sharley study was specifically noted and discussed in the Environmental Review as a key consideration in the determining of location of the coastal setback (p51).

2.5.7 There is a link between the sustaining marine and land environments. The Marmion Marine Park is already bordered by housing along the coast, somewhere this needs to stop to maintain the flow between the sea and the land.

A zone of contact between marine and inland terrestrial environments more than a kilometre in width will be provided by the 305ha of proposed Parks and Recreation zoned land at Mindarie as shown in Figure 3.5 in the Environmental Review. Supplemental interface between the land and ocean will also occur via coastal reserve setbacks for the entire stretch from Ocean Reef to Mindarie as shown in the same Figure.

2.6 Dunes

2.6.1 The dunes at Burns Beach have been highly degraded by uncontrolled vehicle access into the area. The creation of a conservation reserve and controlled access to the beach will alleviate this problem.

Agreed

2.6.2 The expansion of the Burns Beach foreshore by 100 - 200m will assist in the protection of the sand dunes.

It is agreed that expanding the existing coastal reserve will assist in this (refer Response 2.5.2).

2.6.3 Windbreaks along the foreshore should be established in the early phases of development to prevent further wind erosion of the dunal system.

Agreed. These measures will be developed and implemented as part of the Coastal Management Plan that is required by the responsible authority as identified in the *Environmental Review Summary Report* (September 1999) for this amendment.

2.6.4 How important is the parabolic sand dune (with regenerative cusps) at Burns Beach? How many people will place enough importance on it to visit it in the future?

Refer response 2.4.7 and 2.6.4..

2.6.5 The dunal system at Burns Beach will be protected from further degradation by off-road vehicles through a sealed road and traffic barrier (fencing) along the boundary of the 120ha conservation reserve.

Noted.

2.6.6 Will a significant buffer be retained around the dunal systems proposed for reservation in Parks and Recreation at Burns Beach?

305ha of coastal dune systems will be retained in regional open space at Mindarie as a result of this amendment. This will be linked to a further 170ha of dune systems inland in Bushplan site 323. This 475ha is a substantial area and no additional buffer is proposed, although hard management interfaces, such as fenced roads, will be required between urban and dune conservation areas.

2.6.7 Dunefields are a system and a system should be contiguous. A very large area of this dune system would need to be bulldozed to accommodate the residential development.

It was partially in recognition of this issue that criterion 7 was applied to the positioning of regional open space at Mindarie (p18 of the *Environmental Review*). The location of conservation space in the subject land allows for continuity of the parabolic dune rim and perched dunefield with adjoining, contiguous areas in the land to the north and north-east of the subject land.

Pollution management

2.7 Groundwater quality

2.7.1 Object to development of Pt Lot 2 as the Tamala Park Landfill is unlined. A plume of contaminated groundwater will eventually reach Pt Lot 2 before entering the ocean. May also affect Lot 17 to some extent. (Proposal 1 & 2).

The generation of leachate from the Tamala Refuse Facility is the subject of ongoing groundwater monitoring programs instituted at the site by the Mindarie Regional Council, CSIRO and the Health Department (Mindarie Regional Council, 1989). Prior to any groundwater extraction activities in the area of Proposal 1 or 2, appropriate testing will be undertaken to determine whether the quality of the groundwater is suitable for extraction. If investigations reveal the groundwater to be contaminated, the plume may be remediated appropriately.

As documented in the Environmental Review for Proposal 1 (p61-62), modelling and monitoring of the plume from the Tamala Park facility indicates that after 10 years of operation there has been little detectable change in groundwater quality even immediately adjacent to the landfill itself. The plume has also been modelled to ultimately travel in a westerly direction from the facility which should take it through the south of Lot 17 and the north of Lot 2 – both of which are proposed for regional open space and not urban development.

Social Surroundings

2.8 Recreation

2.8.1 The proposed development of Burns Beach will incorporate the creation of a parkland of 109ha for the community to enjoy.

Agreed.

2.8.2 The proposed development and upgrade of recreational facilities at Burns Beach, particularly on the beachfront, will allow greater, controlled use of the area by the public.

Agreed.

2.8.3 The Burns Beach bushland should be fully protected as it is a tranquil place where the public can enjoy activities such as bushwalking and be educated at the same time.

A 305ha coastal reserve, with active environmental management measures, will be reserved as a result of the amendment to provide for these values at Mindarie.

2.8.4 The aesthetic qualities of the Burns Beach landscape should not be dismissed. The area has fine coastal and bushland scenery.

Refer Response 2.8.3.2.9 *Other*

2.9.1 The proposed development at Burns Beach should be designed to discourage future residents from total reliance on the car through providing easy walking access to all essential facilities.

Agreed. The planning of the subdivision design for the current structure plan for the subject land has included the concept of 'walkable neighbourhoods' as an integral component (p8 of the Environmental Review).

2.9.2 What plans does the government have, if any, to compensate the owners of the Burns Beach land for their willingness to offer the government approximately 120ha for inclusion in a Parks and Recreation reservation? The owners should be compensated.

The compromise that is offered by the owners is one of not seeking compensation on the 120ha to be reserved for Parks and Recreation on the basis that the balance of Lot 2 is rezoned to Urban and approved for residential development.

2.9.3 Urban sprawl should be resisted where possible.

Refer Response 1.1.2 and 1.1.3.

2.9.4 No mention has been made of Lot 11536 north of Burns townsite. This area should be retained as public open space and serve as a buffer zone between Burns community and Lot 2. The boundary peg located at the north-east corner of lot 11536 is the same peg used to determine the 55ha granted for development.

As Lot 11536 is outside of the land proposed for urban rezoning (Western Cell, Pt Lot 2, Burns Beach), this area is not part of the current proposal. Therefore it will remain in its current status as far as this proposal is concerned.

2.9.5 The development will allow 1400 families to enjoy seaside living and is within easy commuting distance of the freeway, railway and City of Joondalup with its plethora of facilities.

Agreed – the proposal complements and fits within the planning framework for the North West Corridor Structure Plan.

2.9.6 If development on Lot 2 and 17 goes ahead there is nothing to lift the public's souls and spirits. It will deny residents of having a connection with the land. People have a right to look at the beauty as the drive to and from their homes (Proposal 1 & 2).

It is in recognition of community values that 305ha of regional open space will be provided at Mindarie as an outcome of the Clarkson-Butler amendment. The owners of Lot 2, who are themselves a trust of 600 Western Australian families, are providing 120ha of their own land free of cost to the community to achieve this.

Urban development of a portion of Lot 17 was proposed during early regional planning for the north-west corridor. The development of less than half of Lot 17 as residential and public open space will not significantly deteriorate the amenity value of the local area. The proposed reservation of the southern portion of Lot 17 as Parks and Recreation and subsequent rehabilitation of this area as close as possible to its original condition will enhance the landscape value to local residences and people utilising the adjoining transport corridors.

2.9.7 Are environmental values going to be compromised? Does society require yet more housing in preference to urban renewal and higher density in established suburbs?

Refer response 2.9.6.

2.9.8 Pt Lot 2 is still zoned Rural and a Special Control Area should be made over the entire site or else a Special Planning Policy made for this whole site. Alternatively funds need to be made to be secure to purchase the land, perhaps by raising the Metropolitan Region Improvement Fund. A land swap is another alternative.

The land in question is already subject to special government planning policies and negotiations via the Draft Bushplan process and assessment via the combined planning/environmental statutory 48A assessment processes. Given that environmental planning issues are the key concerns here, these are appropriate mechanisms to address the subject land. The owners of Lot 2 have already engaged in land swaps and other planning mechanisms in relation to other areas of land they desired to develop in the area. This has been investigated in relation to the Western Cell and there appears to be very little potential for this solution in the case at hand.

2.9.9 The urban boundary proposed seems to have more to do with developing land along the coastal part of the lot than maintaining environmental values.

The environmental criteria that were applied to positioning the development zone were clearly outlined in the Environmental Review (p16-18). These also resulted in the urban zone occupying some coastal land and it is merely good

integrated planning if plans to develop degraded areas and retain areas of good condition can also maximise development value.

2.9.10 Three alternatives to the proposed urban zoning of Pt lot 2 Burns:

- a) allow a small amount of development along Marmion Avenue where 4WD vehicles have destroyed the vegetation;
- b) conserve the most important areas but allow some 2.5ha lots along Marmion Ave and in other limited areas with clearing covenants; or
- c) conserve the bushland and allow a hotel type resort with limited road access.

The impacts from 4WD vehicles are greatest in and about the blowout areas and the western portion of the cell. These areas have been identified for development in the proposed amendment. To develop on the eastern margin of the subject land would sever any corridor of ecological transition and connectivity with land to the east, which was identified as a concern of the EPA in Bulletin 880. The details of final specific land uses such as lot sizes and other considerations will be a matter for finalisation between the land owner and the relevant planning authorities.

2.9.11 It would be appropriate to seek deferral of any decision on the Pt Lot 2 proposals until such time as the City of Wanneroo's investigations for Lot 17 (which will also embrace Lot 2) have been concluded (City of Wanneroo).

It is appropriate to make land use planning decisions on Pt Lot 2 in conjunction with decisions regarding Lot 17. This will enable an integrated regional planning and environmental assessment view to be adopted.

2.9.12 We will be judged severely by future generations for the destruction we have wrought on the environment in pursuit of financial returns (i.e. greed), just as previous generations stand condemned over over-clearing in rural areas of WA resulting in salinity.

Environmental Management Plans are required to be prepared by the land developers and implemented as detailed in the draft Environmental Management Measures in the *Environmental Review Summary Report* for the Amendment. These management plans will seek to reduce potential impacts and manage the land so as to retain its ecological values. Also refer Response 2.9.7.

2.9.13 The people have a right to expect the Government to respect the human needs and heritage of its people. This is not a matter of emotionally devoid statistics and our heritage should be protected (Proposals 1 & 2).

Aboriginal and European heritage were investigated as part of this Amendment and appropriate measures have been identified to ensure that any issues associated with these factors will be managed during the development of the amendment area.

3. SUBMISSIONS ON PROPOSALS 2 TO 6 OF THE AMENDMENT.

Biophysical

3.1 Vegetation communities

3.1.1 Lot 17 contains remnant vegetation considered to be significant because it:

- i) is situated within the Cottesloe Central and south vegetation complex which is poorly conserved, particularly near its western extent (Trudgen 1990);
- ii) includes a relatively large area of *Dryandra sessilis* heathland, which whilst characteristic of the western portion of the Spearwood Dune vegetation only has limited representation in the conservation estate. These heathlands are considered to be important for food and habitat resources for wildlife;
- iii) is in close proximity to other remnant vegetation linking Neerabup National Park to the coast; and
- iv) is partly in good to very good condition but the eastern portion is mostly degraded (Proposal 2).

The conservation status of the Cottesloe Central and South Vegetation Complex is already adequate in terms of the draft Perth's Bushplan criteria for protection of vegetation complexes in the Perth region. At present more than 15% of the original area of this Complex is protected in conservation reserves. Draft Perth's Bushplan proposes to protect an additional 1,237ha (Government of WA, 1998). The northern portion of Lot 17 contains vegetation representative of the Cottesloe Central and South Vegetation Complex however, this was not recognised in Bushplan as regionally significant and therefore not worthy of protection at a regional level.

The *Dryandra sessilis* Heath located on the western portion of the area of Lot 17 proposed to be rezoned to Urban Deferred most closely corresponds to Floristic Community Type 26b which is currently well reserved in conservation estates on the Swan Coastal Plain (Gibson *et al.*, 1994). In particular, this vegetation type is found within Neerabup National Park and in Lot 14 which is proposed as an addition to the Park area.

The close proximity of other remnant vegetation to Lot 17 is not a justifiable reason for reservation by itself. The importance of maintaining a linkage between the coast and National Park is addressed in the Amendment through

reservation of a section of the southern portion of Lot 17 (Tamala Park) and will be accommodated by the planned future rehabilitation of this area.

Furthermore, the recognition of the conservation significance of remnant native vegetation is dependent on a number of factors as identified in the following table.

**Criteria for Locally and Regionally Significant Bushland
(Urban Bushland Strategy, 1995)**

REGIONALLY SIGNIFICANT	LOCALLY SIGNIFICANT
Example of a regional vegetation type which is threatened or poorly reserved or a site with special value for flora or fauna conservation.	One of the better examples of a local vegetation type.
Having considerable biodiversity or supports a population of Declared Rare Flora, priority listed flora, or threatened fauna.	Having biodiversity value but unlikely to include Declared Rare Flora. May include geographically significant species at the limit of their range.
Vegetation is in good condition or better. Threatened vegetation types may be regionally significant even if in poor condition.	Vegetation may be in poor condition but if poor, capable of regeneration.
Usually greater than 20 hectares but may be smaller in the case of threatened or poorly reserved vegetation types, or in areas with special significance for other purposes.	Ideally greater than 4 hectares but smaller areas may be of significance depending on how much remains in the locality.
Suitable for passive recreation by people from both within and beyond the locality.	Suitable for passive recreation by the local community.
Region wide use or potential for scientific or educational study.	Use or potential for use by local schools.
Having cultural heritage values of a regional or greater significance.	Having local heritage value.
Regular shape is desirable unless the area functions as a significant corridor linking other remnants.	Shape not critical but remnant should be capable of ongoing management.

Based on the criteria presented above, the remnant vegetation within the area proposed for rezoning by Proposal 2 is predominantly locally significant with elements of regional significance. The environmental review proposes that proponents will specifically identify any areas containing locally significant vegetation prior to development and that they will demonstrate that subdivision

plans comply with government policies for vegetation management which prevail at that time.

3.1.2 The stand of *Banksia* woodland directly north of the tip site should be retained to widen and strengthen the linkage to Neerabup National Park. Vegetation along this boundary could also be rehabilitated (Proposal 2).

The *Banksia attenuata*, *B. menziesii* Low Open Woodland with Coastal Blackbutt (*Eucalyptus todtiana*) and *E. decipiens* over *Allocasuarina humilis*, *Xanthorrhoea preissii* and *Calothamnus quadrifidus* encompassed a small area at the southern boundary of the Lot 17. Although relatively disturbed, this vegetation type continues outside the boundary of the area relating to Proposal 2, into the area forming Bushplan Site 323. This area will be rehabilitated using local native species following closure of the Tamala Refuse Disposal Site and managed for conservation purposes with the ultimate objective of maintaining and enhancing the link between the coast and Neerabup National Park.

The southern boundary of the site is mostly cleared or parkland cleared or has vegetation in poor condition. There is very little opportunity to widen the link based on the existing vegetation.

3.1.3 The proposed east-west distributor roads through Neerabup National Park are poorly placed and will create a much less viable area for the conservation of flora and fauna. These roads should not be developed (Proposal 3).

The *Neerabup National Park Roads Study Biological Assessment: Spring Survey* (March 1997) addresses this issue at Chapter 6 (Environmental Impact and Management) and Chapter 7 (Recommendations). In particular, the segregation of fauna habitats by the proposed road is recognised. It is considered that the resultant areas will remain adequate as fauna habitats provided that animals can move freely between these areas. Therefore, fauna underpasses will be provided to allow access between habitat patches. Installation of fauna underpasses has been agreed to by the proponent.

3.1.4 The widening of Wanneroo Road will impact on remnant vegetation within the road reserve and associated environmental values. The vegetation is significant as it acts as a buffer or extension to the park and contains significant stands of trees. (Proposal 4)

The 3.7ha of vegetation that lies outside the existing road reserve that will be impacted by this proposal is in highly variable condition. The vegetation is generally in narrow strips which have been affected by weed invasion and rubbish dumping. It is acknowledged that the widening of Wanneroo Road will inevitably lead to a slight increase in the degree of severance which already exists between Neerabup National Park and Nowergup Lake Fauna Sanctuary, however, the widening of the road is necessary for the improvements to safety

given the significant number of fatalities along this alignment combined with the predicted increase in traffic estimates based on land use planning assumptions. Clearing to take place will be kept to a minimum through design techniques such as steepening of batter slopes, retaining some grade separation and generally retaining as much vegetation as possible.

The small reduction in the area of remnant vegetation that will result from this proposal will be more than offset by the net gain of these community types through reserving certain parcels of land for conservation purposes, proposed by this Amendment, that will eventually be added to Neerabup National Park.

3.1.5 Studies of historical aerial photographs show that large parts of the vegetation to be cleared for the proposed freeway, in particular the northern part of Burns Beach Road - Neerabup Road section and most of the section between Lukin Drive and Romeo Road, were not affected by human activity for more than thirty years (Zelinova 1999) (Proposal 5)

Acknowledged, however, the proposed alignment of the transport corridor has been planned since 1976. The corridor has been designed to minimise the environmental impact of construction and operation on the natural vegetation, particularly in the vicinity of the Neerabup National Park. The location of the railcar depot (Proposal 6) was moved from an area at Tamala Park where vegetation was of high conservation value, to an area just south of Lukin Drive where vegetation had been substantially degraded by grazing and clearing. This relocation of the railcar depot allows the consolidation of the freeway and railway corridor to a minimum cross section at Tamala Park and minimises the impact on the environmentally valuable land in the southern area of the National Park.

Furthermore, the proposed amendment will result in additional areas of high quality remnant vegetation being added to Neerabup National Park in almost pristine condition, well in excess of the amount to be impacted upon. This is considered to be a positive outcome for the conservation estate.

3.1.6 The proposed railcar depot may lead to future impacts on the priority flora species *Acacia benthamii* which has been recorded nearby. A survey should have been undertaken for this species prior to the Environmental Review documents being prepared. More information is needed on this species (Proposal 6).

A record of *Acacia benthamii* was noted at a single location just north of Hester Avenue in the area of the proposed railcar depot. The responsible authority will require the proponent to determine the extent of the population of *A. benthamii* within the areas of Neerabup National Park adjacent to the proposed railcar depot prior to commencement of site works. This will establish the proportion of the population, which could be affected by the construction. Management measures will be implemented to the satisfaction of CALM.

3.1.7 How will the roads planned through the National Park be designed, constructed and managed to prevent weed invasion? (Proposals 2-6)

The *Environmental Review Summary Report* for this amendment indicates that the responsible authority will require preparation of environmental management plans including Vegetation Management Plans which will address weed eradication for the proposed east-west roads, and the freeway and railway extensions to the satisfaction of CALM. For Proposal 3 (east-west roads) in particular, further information on this issue is provided in *Neerabup National Park Roads Study Biological Assessment: Spring Survey* (March 1997) at Chapter 6 (Environmental Impact and Management) and Chapter 7 (Recommendations).

The proposed railway and railcar depot (Proposals 5 & 6) will be the subject of a weed control program developed and implemented by the proponent in areas affected by noxious or exotic weeds to the satisfaction of CALM. The railcar depot is to be protected with security fencing, which will prevent unauthorised access to Neerabup National Park along its perimeter. This will assist in reducing weed invasion by preventing off-highway vehicles using the Park from this area. As the railway is to be located in the median of the freeway, the weed management program applied to the freeway will also benefit the railway.

It is also standard practice for Main Roads to prepare an Environmental Assessment and Management Plan (EAMP) for each stage of the proposed works prior to construction. The EAMP will contain a detailed assessment of environmental matters and management prescriptions, including commitments regarding weed control.

3.2 *System 6/ Bushplan*

3.2.1 What is the justification for the width of the corridor linking Burns Beach and the Neerabup National Park to be reduced from the size proposed for reservation in draft *Perth's Bushplan*? The boundaries should be compatible with that shown in draft *Perth's Bushplan*? (Proposal 2).

The proposed development of Lot 17 Marmion Avenue (Proposal 2) will not reduce the area of the link to the south at the Tamala Refuse Disposal Site as represented in draft *Perth's Bushplan* (Site 323).

The majority of Bushplan Site 323 is proposed to be reserved by this amendment for Parks and Recreation. Vegetation on the remainder of the site is protected through the current environmental approval for operation of the disposal facility.

3.2.2 Why has not all of Lot 17 Mindarie been proposed to be reserved for Parks and Recreation? This reservation would provide a link between the coast and Neerabup National Park and should be supported. (Proposal 2)

Amendment 992/33 proposes to reserve land adjacent to Neerabup National Park totalling 190ha for Parks and Recreation, and a further 277ha of land in Tamala Park and Burns Beach for Regional Open Space equating to 467ha to be reserved for conservation purposes. On this basis, the east-west link between the coast and Neerabup National Park will be retained and enhanced as part of the amendment process.

3.2.3 Lot 17 forms a vital link between Neerabup National Park and the Coast (Proposal 2).

The southern portion of Lot 17, particularly the vegetation surrounding the Tamala Waste Disposal Site is identified as draft Busplan Site 323, which joins Burns Beach bushland, Site No. 322. Site No. 323 is recognised in the draft Perth's Bushplan as being part of a regionally significant contiguous bushland linkage between Burns Beach Bushland and Neerabup National Park (Government of WA, 1998). The southern portion of Lot 17 will be enhanced to maintain the conservation linkage between the coast and Neerabup National Park.

3.2.4 NPNCA has previously agreed in principle to excision of isolated sections of Neerabup National Park on the basis of additions in other areas. The additions to the Park will create a larger overall Park area and consolidate boundaries but will not minimise the degradation potential from increasing use around the National Park (CALM - Proposal 2).

It is anticipated that the potential edge effects associated with bushland in an urban setting will be minimised through the construction of the railway and freeway corridor. The corridor will function as an effective barrier to most impacts associated with urban development such as vegetation trampling, off-road vehicles, garden waste dumping and domestic pets. At present the Park is freely accessible on the western side.

3.2.5 The discussion regarding the impacts of this proposal on the vegetation of Neerabup National Park understates the impact the fragmentation of the east-west roads will have on the integrity and long term manageability of the Park. (CALM - Proposal 3)

The Environmental Review for Proposal 3 clearly states that clearing of land for the proposed east-west roads will result in fragmentation of the vegetation of Neerabup National Park (pg. 16-17 of the review). It should be noted, however, that Neerabup National Park is already divided in two by the existing Quinns Road and therefore the widening of Quinns Road for the extension of Hester Avenue will have minimal impact on the fragmentation already occurring

in this part of the Park. The construction of Neerabup Road is another matter, however.

The Environmental Review notes that potential impacts from fragmentation of vegetation include isolation of plant and animal populations from other populations leaving them susceptible to local extinction and the potential for loss of genetic diversity through inbreeding, thereby lowering the long term integrity of the Park:

“Ramifications for Neerabup National Park in the short term are probably minimal as the reserve is large enough to support viable and isolated populations. However, in the long term, vegetation communities present in the park may become more susceptible to disturbances, such as fire, disease and weeds.... The addition of roads through the Park decreases the amount of land in the centre which can be successfully buffered from edge effects. Therefore the Park’s habitat size, quality, vegetation condition and species richness may be diminished.

Isolation of local populations may result with the gradual extinction of these populations. The decline of species richness and diversity that may occur within the Neerabup National Park may be directly attributed to a reduction in the gene flow from surrounding areas.” (p 17)

The above impacts notwithstanding, vegetation communities lost as a result of construction of the extension of Neerabup Road and Hester Avenue are considered to be adequately represented in the adjacent Neerabup National Park. Native vegetation present along the border of each alignment will be protected from potential impacts from building the roads and increased edge effects associated with use of the roads through the erection of appropriate fencing, and the preparation and implementation of a Vegetation Management Plan to the satisfaction of CALM, as outlined in the *Environmental Review Summary Report*.

Furthermore, the long term viability and manageability of the Park is considered to be improved by this amendment, through the proposed reservation of an additional 190ha of remnant vegetation in very good condition which will be added to the Park.

3.2.6 Neerabup National Park is far too small, reserving an alignment for Neerabup Road will fragment the Park even further (Proposal 3).

It is acknowledged that the construction of Neerabup Road will fragment Neerabup National Park, however the claim that the Park is “far too small” is disputed. Neerabup National Park currently occupies 1060ha. This amendment will impact 140ha of the 1060ha. To offset this impact to the Park, this amendment proposes to reserve an additional 190ha, which, when added to the 382ha of private land already reserved for Parks and Recreation by previous MRS amendments, results in a net increase to the Park of some 432ha. When

this is added to Neerabup National Park, it will occupy nearly 1500ha, which is over three times the size of either Kings Park or Bold Park.

Refer response 3.2.5 above for discussion on the fragmentation of the Park.

3.2.7 Neerabup Road is unacceptable as it proposes to cut across Neerabup National Park at its widest part and is not required. Joondalup, which lies west of Joondalup Lake, manages very well with a road north and south of the lake. (Proposal 3)

There are two main reasons why the extension of Neerabup Road through the National Park is required. Firstly, it will provide access from the Flynn Drive Industrial Area to the Mitchell Freeway. The economic significance of this link is demonstrated by the benefit cost ratio of 14:1 reported for this road in the *Neerabup National Park – Lukin Drive, Hester Avenue, Neerabup Road - Planning Report* (October 1996). The potential environmental impact of this road upon the National Park is recognised but it is considered that appropriate management measures can be implemented to restrict this impact to acceptable levels.

In the case of Joondalup there would definitely be economic benefits from an additional link to Wanneroo Road but the cost to construct an environmentally acceptable link across Lake Joondalup would be prohibitive.

The second reason for supporting the Neerabup Road extension is for access from areas east of the National Park to the proposed Clarkson railway station immediately north of Neerabup Road. This will be the main bus transfer station (and park'n'ride) in this area as the future Merriwa railway station at Hester Avenue is not proposed to provide these facilities due to shortage of land at this location.

3.2.8 Why is it necessary to extend Neerabup Road to within the National Park? (Proposal 3)

Refer to response 3.2.7

3.2.9 The recommendation by Ecologia Environmental Consultants to upgrade Quinns Road (Hester Avenue) should be implemented as against two road reservations to avoid fragmentation of the Neerabup National Park (Proposal 3).

Refer to response 3.2.7 and 3.2.5.

3.2.10 The proposed widening of Hester Avenue is not supported, impacts will include:

- a) loss of remnant vegetation
- b) disturbance of vegetation and soil
- c) spread of weeds

- d) increased roadkills
- e) increased barrier to wildlife.

These impacts should be minimised. Can the median strip be reduced in width? Can the speed limit be reduced? Lower speed limits could reduce likelihood of fauna roadkills. (Proposal 3)

There is currently a 60 metre wide corridor between the Mitchell Freeway reservation and Wanneroo Road that is not part of the National Park. This consists of a 20 metre wide road reserve (Quinns Road) with 20 metre wide strips of unallocated Crown land on either side. The southernmost of these strips was completely cleared several years ago for installation of underground services. The proposed Hester Avenue alignment uses this 60 metre wide corridor except at the Wanneroo Road end where it bends northward following the existing Quinns Road alignment. This alignment generally does minimise loss of remnant vegetation and disturbance of vegetation and soil.

The *Environmental Review Summary Report* (September 1999) for this amendment indicates that the responsible authority will require preparation of Environmental Management Plans including a Vegetation Management Plan and a Fauna Management Plan which will address each of the issues listed in this submission.

Issues such as median width and speed limit will be addressed at the detailed design stage and reductions in both can be considered.

3.2.11 The proposal to run Neerabup Road through a Bushplan site is unacceptable and is strongly opposed. The Hester Avenue alignment should be designed to limit the effects on the Park. (Proposal 3).

As part of the alignment for Hester Avenue is already cleared due to the existing Quinns Road, edge effects will already be present in this part of the Park and it is considered that the widening of the road for Hester Avenue will not exacerbate these impacts. Implementation of the management measures proposed in the Environmental Review for Proposal 3 may also reduce the impact of edge effects through increased and active management. Management measures proposed include minimisation of vegetation clearance through appropriate road design, erection of exclusion fencing and the demarcation of a limit-of-works prior to commencement of site works. Areas with intact vegetation will not be disturbed if outside the limit-of-works. In addition, large trees close to the limit of works will be identified prior to clearing and fenced with temporary fencing to protect them from accidental damage. Areas to be rehabilitated will be seeded or planted with species of local provenance on advice of CALM. Also refer to response 3.2.10.

For discussion on the proposed Neerabup Road alignment, refer responses 3.2.5 and 3.2.7.

3.2.12 How will the potential for off road vehicles to leave the roads and create tracks in the Park, and illegal rubbish disposal and car dumping, be minimised? (Proposal 3)

It is likely that actual construction of Neerabup Road will not occur for some time, however when it does, access to the Park will be prevented through erection of exclusion fencing. When the roads are operational, management of access to the Park is the responsibility of the management authority which is, in this instance, CALM.

Furthermore, these issues will be addressed by CALM during development of the management plan for Neerabup National Park.

3.2.13 Provision to build Neerabup Road on stilts to allow animal access and allow bush to grow underneath would be expensive and unnecessary, as would underpasses (Proposal 3)

It is recognised that the proposed road will segregate fauna habitats but the resultant areas will remain adequate as fauna habitats provided that animals can move freely between these areas. Therefore, fauna underpasses will be provided to allow access between habitat patches. Further investigation of the appropriate size and design of such facilities will be required when the decision to construct the road is made but it is not expected that it will be necessary to “build Neerabup Road on stilts”.

3.2.14 NPNCA agreement to the proposed excisions for the east-west roads is needed (CALM - Proposal 3).

Noted. This will be negotiated at an appropriate time during the process.

3.2.15 CALM is not aware of Proposal 4 and NPNCA need to be briefed (CALM - Proposal 4).

MRWA will contact CALM to arrange an appropriate time for a detailed briefing on the proposal if required, however, the Environmental Review document for Proposal 4 contains sufficient information regarding the potential impacts and recommended management of the proposal.

3.2.16 Proposal 5 appears consistent with those previously referred and agreed to in principle by the NPNCA. It has always been the position of the NPNCA however, that no excisions from Neerabup National Park be made until the agreed additions have been secured. CALM is in agreement with the proposed management measures for this proposal (CALM - Proposal 5).

Proposal 5 has been discussed with officers from both CALM and the DEP during the planning phase and the current position has been referred to the NPNCA and agreed to in principle. Agreed additions have been secured to compensate for the proposed excisions from Neerabup National Park required

by Proposals 5 & 6 and will be ratified by Parliament at the same time as this MRS Amendment.

3.2.17 The possibility of requiring remedial works elsewhere in Neerabup National Park *quid pro quo* for the inevitable residual effects of the transport corridor should be addressed. (City of Wanneroo - Proposal 5)

Any remedial work as a result of construction will be carried out by Main Roads as required. Furthermore, the net additions of land proposed for Neerabup National Park provide a more than acceptable ‘quid pro quo’.

3.2.18 The Mitchell Freeway and rail corridor should not have been planned to cut through a National Park. The planning agencies should acknowledge and respect significant remnant vegetation, not to plan major roads, rail and other services through it. National Parks are, by definition, areas set aside for conservation of flora and fauna (Proposal 5)

The transport corridor proposed by this amendment was planned in the 1970s when the first *North West Corridor Structure Plan* was prepared. Since then, planning and development in this area has been based on the assumption that this development was to take place. Along this coastal area, the planned transport corridor was considered to be the most logical alignment, with respect to the future urban growth. The location of the rail corridor, on the east side of the coastal urban corridor, was also determined by land use planning. This necessitated the rationalisation of private and public lands to allow consolidation of the enlarged Neerabup National Park.

The transport corridor will also act as a substantial barrier to protect the National Park from adverse impacts resulting from to urbanisation to the west.

3.2.19 How can the proposed extension of the Mitchell Freeway through Neerabup National Park be justified? Freeways through National Parks should not be acceptable. As a fundamental principle National Parks and other regionally significant natural bushland areas should be left alone and protected in perpetuity (Proposal 5).

The corridor encroaches on a small part of the southern and northern areas of the National Park, but the major part of the freeway reservation was planned to skirt the western side of the park. Furthermore additions to the park exceed those areas which are taken up by the transport corridor reserve. Also refer response 3.2.18.

3.2.20 Why was an alternative route for the Mitchell Freeway and the railway not retained somewhere else? (Proposal 5).

Refer response 3.2.18

3.2.21 Proposal 5 showing the Freeway alignment includes the two east-west roads but it also shows 5 'nobs' facing inwards to Neerabup National Park. Are these to provide for future proposals for roads across Neerabup National Park? (Proposal 5).

No. The 5 'nobs' facing inwards towards Neerabup National Park represent planned drainage sumps for the transportation corridor. These drainage sumps are proposed to protect the Park from run off from the freeway.

3.2.22 The alternative location for the Railcar depot has been developed in consultation with CALM and the Department of Environmental Protection. CALM is in agreement with the proposed location and environmental management measures for this proposal (CALM - Proposal 6).

The original location for the railcar depot was to be adjacent to Tamala Park. The vegetation in this area of Neerabup National Park has been recognised as being in excellent condition and of significant environmental value. At the request of the DEP, an alternative, less environmentally impactful site was sought, which would still fulfil the requirements of the proposed railway. Such a site was identified at Nowergup and, while still intruding into the Neerabup National Park, the vegetation there was assessed as mainly degraded, due to earlier farmland grazing. The required land area is the same for both sites. The more northerly site at Nowergup will also allow the proposed transportation reserve in the locality of Tamala Park to be reduced significantly which will improve flora (seeds, pollen) & avifauna movement in an east-west direction.

3.2.23 Reservation of 31 ha for a railcar storage facility is excessive. If such a land mass is required it should be located upon land zoned for development, not an A class reserve (Proposal 6).

The railcar depot will provide a railcar servicing facility, provision for train drivers to start & end shifts and a railcar stowage area for out-of-service (off-peak) units, and will be essentially a 24 hour operation. The area of 31 hectares has been assessed as the minimum requirement consistent with good engineering practice, rail operations, safety and the nature of the site. The current proposed location has been selected to minimise environmental impacts and yet to provide an effective facility. See also Response No. 3.2.22.

3.2.24 More land should be added to Neerabup National Park. (Proposal 2 - 6).

See response 3.2.6.

3.2.25 A number of comments are made in the Environmental Reviews regarding the addition and excision of land from within Neerabup National Park. A comparison of the past and proposed excisions with the total area covered in System 6 recommendation M6 and the total area of Bushplan Site 383 (excluding Lake Nowergup Fauna Sanctuary) would be useful (Proposal 2-6).

The System 6 Recommendation for the conservation of Neerabup National Park (M6) incorporated 1,111.5ha (DCE, 1983). The Nowergup Fauna Sanctuary (encompassing approximately 116ha) was included in the area recognised as Neerabup National Park under the System 6 recommendations. The area recommended for protection as Neerabup National Park in Bushplan (Site 383) encompasses approximately 1,858ha including or 1,742ha excluding the fauna sanctuary.

Previous excisions to the Park include a 9ha portion near Tamala Park that was excised for the Neerabup Groundwater treatment Facility in 1997. Other rationalisations have occurred over the last 30 years, however the net effect to the actual size of the Park is minimal.

As previously stated, this amendment will impact 140ha of Neerabup National Park, which presently encompasses 1060ha. To offset this impact to the Park, this amendment proposes to reserve an additional 190ha, which, when added to the 382ha of private land already reserved for Parks and Recreation by previous MRS amendments, results in a net increase to the Park of some 432ha. The total area of the proposed conservation estate for Neerabup National Park, excluding the Nowergup Fauna Sanctuary will be 1,492ha, which is almost 50% larger than that recommended for conservation by the System 6 Report and nearly 86% of that recommended by draft Perth's Bushplan. This is considered to be a satisfactory outcome for the implementation of Perth's Bushplan.

3.2.26 Neerabup National Park is a very important bushland remnant which has been recognised in draft Perth's Bushplan, Site No. 383. Over time Neerabup National Park and adjacent bushland recognised in Bushplan has been subject to many incursions and what remains should be protected. Excisions from Neerabup National Park are environmentally unacceptable (Proposal 2 - 6).

The rezoning proposed by this amendment including the associated extension of the northern freeway and rail corridor is part of long-term regional planning strategies for the north-west corridor. As noted in response 3.2.25 above, the area proposed for conservation purposes under draft Perth's Bushplan as Neerabup National Park encompasses more than 1,858ha which is approximately 750ha more than the area proposed in the System 6 recommendations (1,111.5ha).

The area of land proposed to be added to Neerabup National Park by this amendment (190ha) is far larger than that proposed to be excised for the east-west roads, rationalisation of Wanneroo Road, transport corridor and railcar depot. These additions are consistent with the recommendations for Bushplan Site 383 as they are proposed to be reserved for Parks and Recreation in the MRS.

3.2.27 The amendment should be revised so that the beautiful and natural heritage value of Neerabup National Park remains intact (Proposal 2-6).

Refer to responses 1.1.2, 3.2.6 and 3.2.26.

3.2.28 A number of studies have identified the importance of Neerabup National Park and identified its conservation significance:

- a) Corridor Plan (MRPA 1970)
- b) North-west Corridor Structure Plans (DPUD 1992, MRPA 1977)
- c) System 6 reports (EPA 1983)
- d) Environmental Audit of the North-west corridor (V & C Semeniuk, 1991)
- e) Trudgen (1996)
- f) Keighery et al (1997)
- g) draft Perth's Bushplan (1998)
- h) Alan Tingay and Associates (1998)

The conservation significance of Neerabup National Park is acknowledged in the *Environmental Review Summary Report* for the amendment.

3.2.29 Neerabup National Park already has enough external pressures on it and its boundary shape, being long and narrow, makes it particularly susceptible to other pressures (Proposal 2- 6).

The alignment of the freeway and railway between Neerabup National Park and development at Kinross, Clarkson, Meriwa and Butler will minimise any significant impacts of the eventual urbanisation of the area on the National Park. As the railway is proposed to be constructed to Clarkson within the next few years and the freeway likely to follow prior to the development of much of these areas, the freeway and railway can be considered to act as an effective barrier to edge effects on Neerabup National Park. Impacts associated with future urban development such as recreational activities and domestic pets will be restricted from Neerabup National Park by the physical barrier of the freeway and railway.

In addition, preparation of the environmental management plans as recommended for Proposals 2 to 6 in the *Environmental Review Summary Report* will address the management of edge effects on the Park. Issues to be addressed include the control of off road vehicle use, domestic pets, fire, introduction of disease, dumping of rubbish, weed invasion and stormwater management. These issues will also be addressed by CALM during development of the management plan for Neerabup National Park.

3.2.30 Bushland lost to infrastructure would not be allowed in countries such as Germany. Germany has 30% of their land forested whereas Bushplan aims for only 10% (Proposals 2-6).

It is inaccurate to compare the vegetation on a national scale (e.g. Germany) to the regional scale (e.g. Perth metropolitan region, Swan Coastal Plain). Draft Perth's Bushplan relates to the PMA, which is an urban region rather than the entire country. Furthermore, Bushplan seeks to protect 10% of each vegetation type for regional significance purposes largely based on biodiversity criteria. There is much more vegetation retained in other reserves, State Forests, groundwater protection areas, surface water catchments and private land. These go beyond the objectives of Bushplan. The area of the metropolitan region that contains remnant vegetation is nearly 30%. This does not include the forested Darling Range, which has an even much larger proportion of bushland remaining.

3.2.31 The Environmental Review states "it is considered that the vegetation associations that will be cleared are well represented in secure conservation reserves". This is not a valid statement as Neerabup National Park is a secure reserve yet its vegetation can be acquired or reserved for development (Proposals 2 - 6).

Proposals to excise sections of the Neerabup National Park for development such as regionally important transport routes and other government infrastructure have occurred in the past. All such proposals are subject to assessment by the EPA, NPNCA and must be agreed by both houses of Parliament. In some instances, an exchange of bushland of equal or greater value may be involved. In these instances, there must be adequate and agreed land compensation for any acquired or reserved areas of parkland.

3.2.32 The cumulative impact on Neerabup National Park of this and the other proposals is not considered (CALM - Proposals 2-6).

The EPA, through the format of their Instructions, determined that the amendment would be assessed as separate proposals and therefore the collective impact of these proposals was not considered by the EPA as an important factor requiring assessment. However, the accumulation of all these proposals into one major MRS amendment means that the effects of all proposals are presented and considered together, not in isolation.

The management of the impacts associated with the development of the overall amendment area will be addressed in the environmental management plans outlined in the *Environmental Review Summary Report*, particularly the Vegetation Management Plans that will be prepared to the satisfaction of CALM.

3.3 *Terrestrial fauna*

3.3.1 The heathlands present on Lot 17 are visited by Carnaby's Cockatoo which is declining in population (Dr D. Saunders, CSIRO Wildlife and Ecology, pers comm) (Proposal 2).

The Environmental Review document for Proposal 2 indicated that the Short-billed Black-Cockatoo (or Carnaby's Cockatoo) may occur within the proposal area in suitable feeding habitats, such as the heathlands. The relatively disturbed vegetation within the proposal area may provide a minor food resource for the Cockatoo during the non-breeding season.

It is considered unlikely however, that loss of habitats within the proposal area will affect the conservation status of this species. The linkage proposed in draft Perth's Bushplan between the coast and Neerabup National Park includes the south-western and southern portions of Lot 17 which support representative vegetation and fauna habitats. Protection of large areas of similar vegetation types of higher quality and associated fauna habitats in adjacent Neerabup National Park and nearby Yanchep National Park ensures that significant fauna populations are maintained in the region.

3.3.2 How will the roads planned through the National Park be designed, constructed and managed to avoid any increase in road kills of native animals? (Proposal 3)

The *Environmental Review Summary Report* (September 1999) for this amendment indicates that the responsible authority will require preparation of Environmental Management Plans including a Fauna Management Plan which will address this issue. These management plans include the requirement for the revegetation and rehabilitation of areas in the vicinity of the alignment. These areas may provide more resources or habitat for fauna. Measures such as fauna underpasses and exclusion fencing will also be incorporated into the road design to assist fauna movement between the large habitat areas and to cut down road deaths.

Further information on this issue is provided in *Neerabup National Park Roads Study Biological Assessment: Spring Survey* (March 1997) at Chapter 6 (Environmental Impact and Management) and Chapter 7 (Recommendations).

- 3.3.3 Neerabup Road will fragment fauna habitat in a larger park. Wildlife movement in the park will be impacted upon which is important given its corridor function and its value in retaining habitat on the Spearwood dunes (Proposal 3).

Impact to fauna is not anticipated to be significant as large areas of Neerabup National Park will remain intact, and with revegetation and rehabilitation of areas in the vicinity of the alignments some additional habitat for fauna will be provided. Fauna underpasses, exclusion fencing and appropriate lighting will be incorporated into the road design to limit the number of fauna road kills.

- 3.3.4 Increased road width and traffic volumes will impact on wildlife survival within and movement between remnants (Proposal 4).

It is recognised that the widening of Wanneroo Road may make it more difficult for animals to cross and could result in increased road kills in some areas. A number of management measures will be incorporated into design however to ensure road kills are minimised. These are outlined in the *Environmental Review Summary Report* (September 1999).

- 3.3.5 Construction for the freeway and rail corridor should allow for east to west movement of fauna (Proposal 5).

The desirability of having provision for east–west fauna movement across the transportation corridor at the Tamala Park area has been recognised by the responsible authority and is discussed in the *Environmental Review Summary Report*. However, this corridor will be approximately 80 metres wide at its narrowest point and therefore overpasses or underpasses would be ineffective, as it is considered that native fauna would not use an 80 metre tunnel or a relatively narrow “bridge”. Any crossing of this nature is more likely to be used by feral predatory fauna to the detriment of native fauna.

The construction of fauna underpasses and the erection of exclusion fencing will be incorporated into the road design for Proposal 3, however, to facilitate the movement of fauna from north to south in appropriate areas.

- 3.3.6 The potential impact of noise, lighting or vibration on wildlife or park users is not addressed, this may affect its conservation and recreation value (Proposal 6).

The railcar depot will be designed, constructed and operated to minimise the external effects of noise, light and vibration. Low speed movement of electric traction railcars within the depot should not generate any significant noise and vibration (as demonstrated in the *Environmental Review* for proposal 6). Lighting is to be designed to minimise light spill outside the depot area. External maintenance operations will produce only low levels of noise while any more extensive maintenance will be undertaken inside building designed to limit any generated noise.

3.4 *Dunes*

- 3.4.1 How will the impacts associated with urban development adjacent to the proposed Parks and Recreation reservation of part of Lot 17 Mindarie/Tamala Park be managed to protect the unique parabolic dune in this area (which provides a record of changes in climate, sea level and wind patterns through geological time)? (Proposal 2).

The parabolic dune ridge extending from the coast to Connolly Drive is located outside the area designated as Proposal 2. The proposed reservation of the southern portion of Lot 17 as Parks and Recreation will ensure preservation of the parabolic dune ridge. Management of the reserve including protection of the landform will be addressed following closure of the refuse facility and subsequent rehabilitation of the site.

3.5 *Groundwater quantity*

- 3.5.1 Groundwater abstraction associated with future urban development at Lot 17 Mindarie should be resolved in consultation with the Water and Rivers Commission (Proposal 2) (Water Corporation).

Noted. It is anticipated that any groundwater requirements will be established through the Water and Rivers Commission's groundwater extraction licensing process.

Pollution management

3.6 *Odour*

- 3.6.1 The northern portion of Lot 17, not affected by the operational buffer of the refuse disposal facility, should be included in the Urban zone instead of the Urban Deferred zone (City of Stirling, City of Perth, City of Wanneroo - Proposal 2).

The proposed changes above constitute a significant modification to the Amendment, which is not supported by the Responsible Authority at this time. The proposed zoning for the northern portion of Lot 17 from Rural to Urban Deferred remains unchanged.

- 3.6.2 The amendment documents should be modified to clarify that it may not be necessary to cease refuse disposal facility operations to permit the development of the land outside of the operational buffer (City of Stirling, City of Perth, City of Wanneroo - Proposal 2).

The amendment documents do not need to be modified as this intention is clearly spelt out on page 17 of the Environmental Review for Proposal 2 as follows:

“Development of the land in the northern portion of Lot 17 will be staged, with land inside the 500m odour buffer developed in accordance with the cessation of landfill activities at the Tamala Refuse Facility.”

In addition, page 50 of the Environmental Review notes that:

“It is anticipated that the residential development of the northern portion of Lot 17 will be consistent with the development and operational plans for the refuse facility. Areas of the proposal area affected by the refuse facility odour buffer will not be developed until constraints to development are alleviated by either the closure of the facility or demonstrated to be unnecessary to the DEP’s satisfaction through odour modelling.”

3.6.3 The operational buffers for not only the existing 11 hectare landfill site, but also a proposed Stage 2 site of area 11 hectares, together with a potential third stage to the west of the existing operations as an “in lieu” allocation for land previously not used as a result of ethnographic considerations, should be preserved (Mindarie Regional Council - Proposal 2).

Stages 2 & 3 of the Tamala Disposal Facility are proposed to occur within the Public Purposes reserve proposed by this amendment. Operational buffers for these stages will be maintained in accordance with the requirements of the EPA.

3.6.4 It is important that an appropriate buffer is maintained from the landfill operation. The current criteria is 500m set by the Environmental Protection Authority (Proposal 2).

Acknowledged. A buffer of 500m as required by the EPA will be maintained between the landfill operation and proposed Urban development. The proposed development of the northern portion of Lot 17 will be staged to ensure that residential development and landfill operations are not compromised.

3.6.5 Land use external to the leased area should be such that the current and potential waste management operations on this land are not compromised, particularly in regard to usage for landfill (Mindarie Regional Council - Proposal 2).

See response 3.6.2 and 3.6.4.

3.7 Greenhouse gases

3.7.1 To suggest any real difference to greenhouse gas emissions will be achieved is doubtful in this relatively small area (Proposal 3).

It is acknowledged that any difference in greenhouse gas emissions will be minor. However, the provision of more frequent access to the Mitchell Freeway from both Wanneroo Road and other adjacent areas will reduce the length of trips by many commuters and encourage use of the Freeway, leading to less traffic congestion. Both these circumstances will reduce the total emissions from vehicles in the area which will result in less greenhouse gases reaching the atmosphere. While the reductions are small and do not provide the sole justification for the roads, such environmental considerations are valid and are important in fostering due concern for the atmosphere by the community in general.

3.8 *Groundwater quality*

- 3.8.1 Object to development of Pt Lot 2 as the Tamala Park Landfill is unlined. A plume of contaminated groundwater will eventually reach Pt Lot 2 before entering the ocean. May also affect Lot 17 to some extent. (Proposal 1 & 2)

See response 2.7.1.

3.9 *Surface water quality*

- 3.9.1 Drainage management, particularly the containment of potential pollutants, is considered to require more attention (City of Wanneroo - Proposal 6).

The responsible authority shall ensure that best practice drainage design will be incorporated at the detailed design and construction phase of the project to facilitate the containment and removal of any pollutants. This is outlined in the *Environmental Review Summary Report* as a requirement of the Construction Management Plan. See also response 3.12.13.

Social Surroundings

3.10 *Aboriginal Culture and Heritage*

- 3.10.1 CALM is considering a realignment of the Yaberoo Budjara Heritage Trail and will consider infrastructure proposals as part of this process (CALM - Proposal 3).

Noted.

3.11 *Non-Aboriginal heritage*

3.11.1 Neerabup National Park has its place in history (Yaberoo Budjar Heritage Trail and the 10th Light Horse Heritage Trail run through the Park) (Proposals 2-6).

The proposed development of the northern portion of Lot 17 (Proposal 2) and the proposed rationalisation of Wanneroo Road (Proposal 4) will not impact the alignment or cultural history of either the Yaberoo Budjar Heritage Trail or the 10th Light Horse Heritage Trail. However, Proposals 3 and 5 will have an effect on the Yaberoo Budjar Heritage Trail. The 10th Light Horse Heritage Trail is unaffected by the amendment.

The Yaberoo Budjar Heritage Trail is already impacted by Quinns Road and therefore construction of Hester Avenue will also affect it. Additionally, the Yaberoo Budjar Heritage Trail will be severed by the proposed alignment of the transportation corridor (Proposal 5) as it passes through the south-west corner of Neerabup National Park.

The parts of the Trail affected by the amendment are currently proposed for rehabilitation or realignment by CALM. It is also expected that through consultation with CALM and other appropriate agencies, that the heritage values of Neerabup National Park, including the heritage trails, will be maintained and addressed in the development of the management plan for Neerabup National Park.

3.12 *Other*

3.12.1 The Quinns Rock Environmental Group support the preparation of Vegetation and Fauna Management Plan and would be interested in contributing to this plan. The interface between the development and the bush needs to be designed and management addressed in these plans (Proposal 2).

Noted. The Quinns Rock Environmental Group should contact the City of Wanneroo prior to preparation of the Vegetation and Fauna Management Plan.

3.12.2 There is no requirement for Neerabup Road. Wattle Avenue south to Flynn Drive has access to Freeway via Quinn/Hester Road off Wanneroo Road. From Flynn south to Burns Beach Rd they have access via Burns Beach Rd to Freeway. The Flynn Drive Industrial Area is accessible from Joondalup Drive in the medium term. Lake Joondalup forms a barrier to the south for over 7.5 kilometres and there is no need for a road across the lake (Proposal 3)

See response to point 3.2.7

- 3.12.3 Proposal 4 seeks to excise 2.7ha from existing conservation reserves. The need for excision of land, albeit small, for the junction of Neerabup Road and Wanneroo Road is questioned. (Proposal 4)

The alignment requires these excisions to the National Park, but in return for which larger areas will be provided and returned to the Park. The widening of the road and the proposed junction of Neerabup Road and Wanneroo Road is necessary for the improvements to safety given the significant number of fatalities along this alignment combined with the predicted increase in traffic estimates based on land use planning assumptions. See also response to 3.1.4.

- 3.12.4 The Environmental Review for Proposals 3 and 5 discussed other alternative routes. Questions such as what proportion of population north of Burns Beach road will work in Joondalup business area, locally or in the Regional Centre at Alkimos, whether it is necessary to have three major roads and a freeway within a strip of land 4-6 km wide, are not discussed either (Proposal 3 & 5).

Traffic forecasts based on land use planning provided by Ministry for Planning as outlined in the *Neerabup National Park – Lukin Drive, Hester Avenue, Neerabup Road: Planning Report* (October 1996). clearly indicate the need for a major freeway and other north-south roads as proposed in this amendment.

The east-west roads (Proposal 3) are required to allow access to the proposed Clarkson and Merriwa railway stations from Wanneroo Road. Additionally, Neerabup Road is required to provide access from the Flynn Drive Industrial Area to the Mitchell Freeway. See also Response 3.2.7.

- 3.12.5 The Gingin Coast Structure Plan may lead to Breton Bay being zoned for Industry, to form a major employment centre. Therefore highly supportive of northern extension of the Mitchell Freeway and rail corridor. Eventually like to see transport corridor extended to Breton Bay (DRD - Proposal 5).

State planning authorities (Ministry for Planning, Department of Transport and Main Roads) are currently developing strategies to address these issues. A study has been initiated to examine land use and infrastructure requirements on the Swan Coastal Plain to Breton Bay.

- 3.12.6 Can the route of the Freeway north of Romeo Road be changed so that the Freeway south of Romeo Road could be moved away from the Park? (Proposal 5)

In practice, because of existing constraints, the answer is no. This alignment has been planned for many years. Refer responses 3.2.18 & 3.2.19.

- 3.12.7 The necessity for extension of the Freeway is questioned given the acute shortage of affordable fuel supply for road vehicles that is certain emerge over the next decade. Note: refer to references given in submission no 267 (Proposal 5).

Our planning must be based on current knowledge and this indicates that traffic volumes will rise regardless of the fuel being used. Moreover, electric rail transport is known to be one of the most efficient and effective forms of moving significant numbers of people from place to place. Electricity in this State is derived from both coal and natural gas, both of which are abundant and available at affordable cost. This amendment provides for the reservation of land to construct such a service, thereby reducing the reliance on the car and the resultant need for fuel.

3.12.8 With the need to increase access to and use of public transport, the Northern Suburbs Railway extension is in the wrong place. It should be relocated on an alignment along Connolly Avenue accompanied by complementary urban development along the lines of the *Liveable Neighbourhoods Community Design Code* (Proposal 5).

Development constraints between Burns Beach Road and Lukin Drive determine the location of the transportation corridor. Department of Transport and Ministry for Planning have recently reviewed the alignment of proposed transportation infrastructure in the northern suburbs and the most logical option for the railway between Burns beach Road and Lukin Drive is the use of the freeway median strip. North of Lukin Drive, the railway alignment is being examined by Transport and Ministry for Planning with a view to locating it more centrally to the future urban development, together with a review of the appropriate form of land use development.

3.12.9 The Environmental Review states that the railway will run in the median of the freeway up to Lukin Drive. The report therefore is incomplete (Proposal 5).

This location of the railway north of Lukin Drive is still subject to investigation. Refer also to response 3.12.8.

3.12.10 Figures 1 and 2 in the Environmental Review do indicate a railway reserve on Wanneroo Road, Carramar. Is this a freight loading platform? (Proposal 5)

References in Figures 1 and 2 to reserves on Wanneroo Road, Carramar are to Primary Regional Roads reservation. There are neither rail reservation nor freight loading platforms planned for Wanneroo Road. Refer to proposal description in the Environmental review for Proposal 4.

3.12.11 Conditions should be imposed on the Freeway reservation. Vegetation clearing should be limited, revegetation with local species should be undertaken from the vegetation to be bulldozed and wildlife movement needs to be catered for (Proposal 5).

Clearing of vegetation will be minimised by demarcation of a limit-of-works prior to commencement of site construction. Areas damaged or cleared during construction will be rehabilitated using suitable vegetative material and topsoil. Native vegetation present along the eastern border of the alignment will be protected from potential impacts of construction and other edge effects, through the erection of appropriate fencing and implementation of the management measures proposed. The responsible authority will ensure the preparation of a Vegetation Management Plan prior to site works which will include management measures proposed above, as outlined in the *Environmental Review Summary Report*. Also refer response. 3.3.5.

3.12.12 The existing alignment of Wanneroo Road should be used for development of the Freeway and rail extension north of Currambine (Proposal 5).

Land use and transport planning has been carried out over a long period of time and future traffic demand estimates indicate the need for all roads in this proposal. Additional reasons against this proposition are:

- a. the transport corridor would be separated from urban development by Neerabup National Park;
- b. the transport corridor would bisect the southern portion of the Park;
- c. there is no substantial residential development east of Wanneroo Road; and
- d. at the northern end, the road and railway would have to be deviated westwards around the Yanchep National Park to join up with the planned alignment of the transport corridor near Romeo Road.

Also refer responses 3.2.18 & 3.2.19

3.12.13 Operational aspects of the proposed rail-car depot are not given in the Environmental Review so it is difficult to develop an understanding of its likely environmental implications (City of Wanneroo - Proposal 6).

Initially, the proposed railcar depot will be used to store railcars during off-peak service and provide basic cleaning of railcar interiors and windows. The facility will have simple cleaning platforms with a small office/storeroom/amenities area to cater for cleaning staff and associated materials. Operations will be on a 24 hour basis, with lighting and fencing to provide security. In the longer term, the depot may be developed to accommodate external cleaning equipment, maintenance sheds, storerooms, offices and an employees' carpark. Lighting will be designed and installed to minimise external light spill and noise from depot operations controlled to be non-intrusive. All waste water will be initially contained on the site and either processed to an environmentally acceptable level for discharge or removed to an approved treatment facility. See also response 3.2.23.