Perth – Bunbury Highway (Peel Deviation)

Main Roads Western Australia

Report and recommendations
of the Environmental Protection Authority

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Summary and recommendations

This report provides the Environmental Protection Authority's (EPA's) advice to the Minister for Environment on the proposal by Main Roads Western Australia (MRWA) to construct an inter-regional road, on the eastern side of the Peel-Harvey Estuary, to bypass Mandurah. The proposal extends from the southern most portion of the proposed Kwinana Freeway at Stock Road, Lakelands (near Mandurah) south to where it intersects Old Coast Road approximately 2.5 km north of Johnston Road.

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

Relevant environmental factors

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

- Vegetation Communities
- Declared Rare and Priority Flora
- Wetlands
- Traffic Noise

Conclusion

The EPA has considered the proposal by MRWA to construct an inter-regional road on the eastern side of the Peel-Harvey Estuary to bypass Mandurah and the comments raised by government agencies and public submissions.

The EPA notes that:

- the proposal has been identified in planning documents for the Peel Region since the 1980s;
- the northern section of the alignment (north of the Murray River) is highly constrained by the location of the southern extent of the Kwinana Freeway alignment and existing urban subdivision including Lakelands and Murray Lakes estates;
- the central portion of the alignment is predominantly located within cleared farmland;
- the alignment has been selected to minimise impacts on wetlands to the extend that no wetlands protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy are impacted and only one wetland of conservation significance (at the Serpentine River crossing) is affected;
- the southern section of the alignment (south of the Harvey River) impacts on vegetation contained within an area identified as proposed addition to Yalgorup National Park;

- the management plan for Yalgorup National Park and the EPA's System 6 reports recognise that the proposal may impact on vegetation within the proposed National Park;
- MRWA is currently undertaking a review of its policy on operational traffic noise in consultation with stakeholders including the EPA and DEP; and
- the road is not likely to be constructed for at least five years.

The EPA has concluded that the proposal is capable of being designed and managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 3 and summarised in Section 4, including the proponent's commitments.

Recommendations

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

I. That the Minister notes that the project being assessed is for Main Roads Western Australia to construct an inter-regional road on the eastern side of the Peel-Harvey Estuary to bypass Mandurah.;

II. That the Minister considers the report on the relevant environmental factors as set out in Section 3;

III. That the Minister notes that the EPA has concluded that the proposal can be designed and managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 3 and summarised in Section 4, including the proponent's commitments;

IV. That the Minister imposes the conditions and procedures recommended in Appendix 3 of this report.

Conditions and Commitments

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by MRWA, to construct an inter-regional road on the eastern side of the Peel-Harvey Estuary to bypass Mandurah, is approved for implementation. These conditions are presented in Appendix 3. Matters addressed in the conditions include the following:

- that the proponent be required to fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3. The conditions and commitments include a:
  - surface water management plan
  - vegetation management plan
  - dieback management plan
  - rehabilitation and landscape plan
  - fauna management plan
  - foreshore management plan

- construction management plan
- spring survey for declared rare and priority flora
- vegetation mitigation plan
- noise management strategy for operational noise

Other Advice

In addition to the recommended conditions and proponent's commitments the EPA advises planning agencies that when considering development applications for noise sensitive premises, adjacent to the Peel Deviation alignment, prior to construction of the road or an agreed position on the management of traffic noise, consideration should be given to the potential for traffic noise from the Peel Deviation. A conservative position should be adopted in terms of buffer distance to the road alignment until an agreed policy on the management of traffic noise is achieved.

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1. Introduction and Background

The proponent, Main Roads Western Australia (MRWA), proposes to construct an inter-regional road on the eastern side of the Peel-Harvey Estuary to bypass Mandurah. The proposal extends from the southern most portion of the proposed Kwinana Freeway at Stock Road, Lakelands (near Mandurah) south to where it intersects Old Coast Road approximately 2.5 km north of Johnston Road (see Figure 1).

The existing Highway on the western side of the Peel-Harvey Estuary, through and immediately south of Mandurah, is constrained by topography, urban development and sensitive environmental area such as the Yalgorup National Park. To overcome these difficulties a proposal to by-pass Mandurah has been indicated in regional and local planning strategies since the 1980s. This proposal has become known as the 'Peel Deviation'.

The current proposal was referred to the EPA as long ago as 5 February 1992 and the level of assessment set at Public Environmental Review (PER). To facilitate regional planning, the MRWA's preferred alignment has been incorporated into the draft Peel Region Scheme (which was recently assessed by the EPA, Bulletin 994). The final approved alignment would also be incorporated into the Town Planning Schemes of the City of Mandurah, and Shires of Murray and Waroona to allow detailed local planning.

The timing for the construction of the Peel Deviation is uncertain and may be greater than 5 years.

In compiling this report, the Environmental Protection Authority (EPA) has considered the relevant environmental factors associated with the proposal, issues raised in public submissions, specialist advice from the Department of Environmental Protection (DEP) and other government agencies, the proponent's response to submissions and the EPA's own research and expertise.

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

A list of people and organisations that made submissions is included in Appendix 1. References are listed in Appendix 2, and recommended environmental conditions and procedures and the proponent's commitments are provided in Appendix 3.

Appendix 4 contains a summary of the public submissions and the proponent's responses. This summary is included as a matter of information only and does not form part of the EPA's report and recommendations. The EPA has considered issues raised in public submissions when identifying and assessing relevant environmental factors.

2. The proposal

The Peel Deviation project proposed by MRWA involves the construction of 52.1 km of dual carriageway freeway-standard highway from the future freeway link north of Mandurah to the existing Perth-Bunbury Highway (Old Coast Road) at Lake Clifton. The deviation will

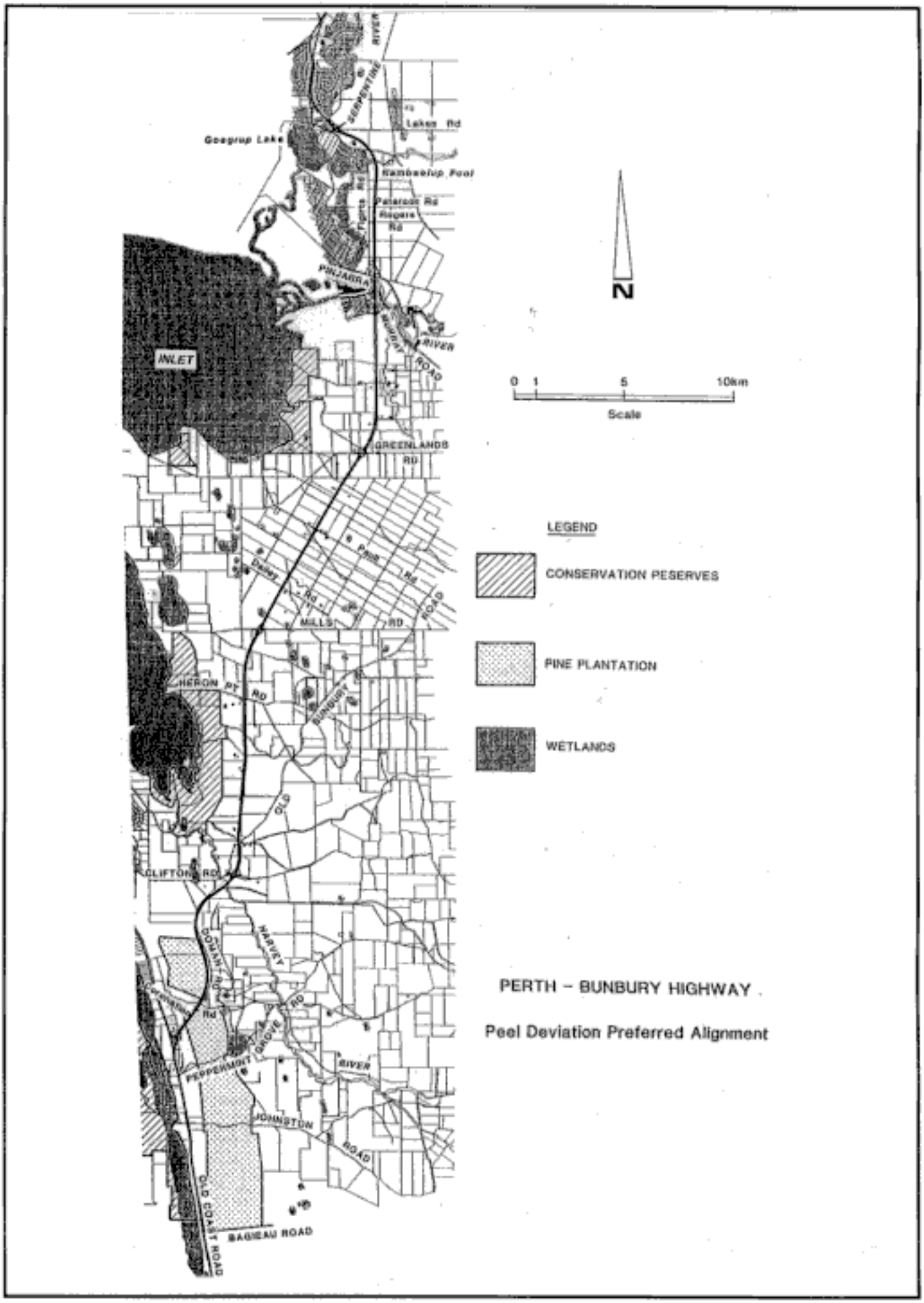

Figure 1. Location of the proposal.

provide a high standard inter-regional road link between Perth and the south west, bypassing Mandurah on the eastern side of the Peel Harvey Estuary.

The highway is likely to be built in stages depending on traffic volume predictions and available funding. Typical stages are single carriageway, then dual carriageway with at-grade intersections, and finally, freeway standard with grade separated interchanges. It is also possible that the project may be built in longitudinal stages such as the Pinjarra Road to Old Coast Road section and the Kwinana Freeway to Pinjarra Road sections being built separately to form the ultimate project. The highway will comprise two 11m carriageways with a median width of 15-40m. Intersections and ultimately interchanges will be constructed at:

- Lakes Road
- Pinjarra Road
- Greenlands Road
- Herron Point Road
- Old Bunbury Road
- Williamson Road
- Old Coast Road

Bridges will be constructed to carry the Peel deviation over:

- Serpentine River
- Pinjarra Road
- Murray River
- South Yunderup Road
- Murray River Floodplain
- Harvey River

Bridges will also be constructed to carry Red Road, Paul Road and Mills Road over the Peel Deviation.

The main characteristics of the proposal are summarised in Table 1. A detailed description of the proposal is provided in Section 2 of the Public Environmental Review (PER) (ecologia, 1997).

3.Environmental Factors

3.1 Relevant environmental factors

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

Table 1: Summary of key proposal characteristics

Element	Description
Location	On the eastern side of the Peel-Harvey Estuary bypassing Mandurah. Extending from the southern most portion of the proposed Kwinana Freeway at Stock Road, Lakelands (near Mandurah) south to the intersection with Old Coast Road approximately 2.5 kilometres North of Johnston Road to the east of the southern most point of Lake Clifton.
Road Length	51.2 kilometres
Formation	Dual 11 metre carriageway freeway standard highway with a median width of between 15 and 40 metres.
Intersections	Lakes Road Pinjarra Road Greenlands Road Herron Point Road Old Bunbury Road Williamson Road Old Coast Road
Bridges over waterways	Serpentine River Pinjarra Road Murray River South Yunderup Road Murray River Floodplain Harvey River
Bridges over Peel Deviation	Red Road Paul Road Mills Road

The process of identifying relevant environmental factors is summarised in Table 2. Having considered appropriate references, public and government submissions and the proponent's response to submissions, in the EPA's opinion, the following are the environmental factors relevant to the proposal:

- Vegetation Communities
- Declared Rare and Priority Flora
- Wetlands
- Traffic Noise

Details on the relevant environmental factors and their assessment is contained in Sections 3.2 - 3.5. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. Submissions on the PER are summarised before the EPA assessment for each relevant factor.

Table 2: Identification of Relevant Environmental Factors

PRELIMINARY FACTOR	PRELIMINARY FACTOR in PER	PROPOSAL COMPONENT WITH POSSIBLE IMPACT	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT ENVIRONMENTAL FACTORS
	BIOPHYSICAL			
	Flora and fauna	Construction of the proposed route may impact of fauna habitat and movement patterns. Clearing of vegetation for road construction may impact on Declared Rare and Priority Flora.	• Insufficient detail has been provided on the flora & fauna surveys to review the adequacy of the work done (although one submitter then notes detailed reports may be available). Flora and fauna surveys should be carried out on a seasonal basis - a one week survey in November 1995 is not adequate and November is the wrong time of year. Under-representation of orchids, trigger plants, & drosera highlight inadequacy of the survey. The inadequacy of the survey is demonstrated by only 14% of native mammals, 42% of bird and 46% of reptile taxa likely to be encountered being encountered. Survey ignored movement of fauna across the Pinjarra Plain. Creditable flora and fauna surveys should be carried out to assess previous impacts and provide a baseline for future planning and management.	These issues are addressed under the factors of Terrestrial Vegetation, Declared Rare and Priority Flora and Terrestrial fauna. **Not considered a relevant environmental factor.**
Vegetation communities	Terrestrial vegetation - general	Construction of the proposed route may lead to clearing of vegetation and degrade existing vegetation quality in the System 6 areas M108, C55 (Clifton MPA), and C56 (McLarty MPA). Construction would result in the clearing of 63 ha of 'poorly reserved' and 0.5 ha of 'unreserved' vegetation.	• There is no indication of the total area of vegetation to be cleared (See also comments under Wetlands - Estuary - Peel Harvey). • There should be a moratorium on all clearing of native bushland given the decline to date of our flora and fauna. • "Cleared agricultural land" should be differentiated on basis of density of deep rooted perennial species, so an assessment of clearing these areas can be made in the context of the Statement of Planning Policy No 2 1992 The Peel-Harvey Coastal Plain Catchment so that there is a net gain in vegetation. Vegetation should be differentiated by occurrence in vegetated basins or flat wetlands. • Clearing McLarty MPA is unacceptable being contrary to State Government policy on remnant vegetation and integrated catchment management. • The route would destroy a 5.6 km strip of Tuart/Peppermint woodland of the McLarty MPA. This vegetation is only reserve in this area and Yalgorup National Park and so its loss is unacceptable. Environment Australia strongly recommends this alignment be reconsidered, with impacts on Lake Clifton also being considered. • Community Type 25 is officially listed as susceptible, and contains Priority 2 flora. Therefore it should not be cleared. • Type 25 vegetation will become, or is already regionally significant because of clearing for urbanisation. (Page 48 of PER says it may be regionally significant). • With the loss of tuart trees and remnant vegetation along the route, it is suggested that the proponent consider a program of bushland	**Considered a relevant environmental factor**

Vegetation communities (cont)	Terrestrial vegetation - general (cont)		replacement, similar to the Wetland Replacement Policy for the Kwinana Freeway. • There is no commitment to seeding or planting of cleared roadsides (relying only on topsoil seed stores) or monitoring/management of rehabilitation success. • There are 16 vegetation associations in the Biological Survey report, but only 13 in the PER, 12 of which do not match those in the Biological Survey. Such inaccuracies do not help! CALM's response in objecting more strongly to severance of the pine plantation than high conservation bushland is disappointing. Compensation to CALM/NPNCA should be provided for nature conservation values as is done for plantation values. • Limestone resources should not be obtained from the proposed extension to Yalgorup National Park but areas with low conservation value should be utilised. The proponent would be advised to secure sources now. • Given the past history of impacts in the Peel Region on bushland and wetlands which has reduced the quality of environment for the present generation compared with the previous, existing remnants should all be protected and it should be recognised that they are all under stress. It is not acceptable to continually take a small portion of remnants because this leads to long-term loss. Ignorance is no longer an excuse.	
Vegetation - Dieback	Terrestrial vegetation - disease	Construction activities may spread dieback into dieback free areas.	• The route through McLarty MPA (S6 C56) is unacceptable because the area is currently dieback free and sourcing dieback free materials in this area may be difficult. • The high water table/moisture levels in the soil make the risk of transmission of dieback high and the flora highly susceptible to dieback. There is evidence adjacent to Goodale Sanctuary of fungal spores being transmitted via road repair.	It is likely that the northern and central portions of the route are dieback infected due to the extent of clearing and presence of dieback transport vectors. The area between Doman Road and Old Coast Road is potentially dieback free. The proponent has provided commitments (Commitment 1 & 9) to develop and implement a dieback management program to the requirements of CALM. **Not considered a relevant environmental factor**
Declared Rare and Priority Flora	Terrestrial vegetation - Declared Rare Flora	Clearing of vegetation during construction may result in loss of individual Declared Rare and Priority Flora.	• The rare Tuart Rufous Greenhood Orchid (*Pterostylls aff. picta*) has been found within the road reserve at the southern end of the road • The route through McLarty MPA (S6 C56) is unacceptable because Priority 2 flora (*Lasiopetalum membranaceum*) are likely to be found in the Vegetation type 25 woodland; Insufficient information is known about the Priority 2 flora to assess the impact on local populations at this stage the vegetation will be affected by weeds.	**Considered a relevant environmental factor.**

Terrestrial Fauna	Terrestrial fauna - general	Construction and operation of the road may impact on terrestrial fauna through loss of habitat and severance of movement corridors.	• The fauna survey should have covered a larger area and included consideration of waterbirds (including migratory). • No reference to Phascogales which reside in bush east of Old Coast Road. Phascogales have been seen both dead & alive in this area. • The consultants comments about their under sampled bat fauna show little understanding of the biology of bats. Preliminary surveys at Goodale Sanctuary 2 km from the site show bats may be a relatively intact and ecologically important component of the mammal fauna surrounding the alignment. • The PER incorrectly assumes that migratory birds will only use wetlands. Rainbow Bee-eaters don't! • Palusplain are important for waterbird breeding and these are de-valued by the proposal. • The PER has not addressed the impacts of lighting, overhead wires and other hazards to waterbirds in an area which is palusplain and near other important wetlands. • The route through McLarty MPA (S6 C56) is unacceptable because it will fragment the area into three restricting fauna movement; small fauna islands will be created making the habitat un-viable for some species; migration pathways are not effective • Fauna (including kangaroo) migration pathways should be required between Patterson Rd & Pinjarra Rd. • The bandicoot underpass proposal is a patently ridiculous throwaway notion. • The Commonwealth Endangered Species Protection Act 1992 database indicates *Myremcobis fasciatus*, *Drakea elastica* and *Dasyurus geoffroii* may occur in the vicinity of the proposed Peel Deviation. Further attention may be necessary to protect them. The Threatened Species and Communities Section - Biodiversity Group of Environment Australian should be advised of the location of the species and proposed actions toward their conservation.	Although the route is predominantly located in cleared pasture there would be some loss of local habitat and relocation of mobile species due to the construction of the road. Given the extent of the proposal, the absence of specifically identified habitat for a particular species, and the proposed landscape and rehabilitation plan (Commitment 10) impacts on fauna would be considered relatively minor. The route also intersect fauna movement corridors associated with the Serpentine River, Nambeelup Brook and Harvey River crossings and adjacent to the Clifton and McLarty MPAs in particular. The proponent has committed to incorporate road design techniques to facilitate fauna movement to the satisfaction of DEP and CALM (Commitment 11) and provide fauna migration pathways in swamp areas and within the State forest to the requirements of CALM (Commitment 11) **Not considered a relevant environmental factor.**
Hydrology		The proposed road crosses an extensive area of palusplain wetland, several minor drainage lines, and the Marray and Harvey Rivers. The crossing of these waterways and wetlands may result in changes to the local hydrology.	• The need to protect wetlands/ground water hydrology could be significant given that the area is seasonally waterlogged (interlinked with other wetlands) and that the road could require removal and replacement of 2 m of material (80 000 m3/km, up to 100 000 truck loads each way for total length of road - not including road-making material and estimating from Beecham Rd to Doman Rd) if geotechnical work (not yet done) finds similar soil foundations	The proponent has committed to undertake design of road drainage according to best practice, including the maintenance of surface hydrology characteristics, (Commitments 1 & 4) to the satisfaction of the DEP and WRC. Satisfactory implementation of these commitments would ensure the local hydrology is maintained with pre-

Hydrology (cont)			conditions to those on the Kwinana Freeway. Other construction techniques (eg. pre-loading, wick drains, the use of enzymes or soil modifying agents) to deal with poor soil foundations may also have adverse impacts. Many culverts would be needed to maintain surface water hydrology. This has not been addressed in the PER, and nor have the cost implications of this aspect (including the need to construct during summer only). • Concerned that ground water flow to Lake Clifton necessary to support the thrombolites may be affected by this proposal. The proponent should assess hydrological impacts at the local level as increased waterlogging can have significant impacts on farming and create bare areas suffering wind erosion and dust problems. This could affect viability of some farming operations. • Given the location of the deviation on Palusplain, the road would be expected to disrupt local surface water and drainage patterns (ie. hydrology). This is not adequately addressed in the PER. • The road formation will remove 439 ha of annual pasture which uses water. The impacts of this on the area's hydrology has not been properly considered. • Road drainage would appear to be contrary to the moratorium on drainage which applies to agriculture. • PER failed to examine impacts on ground water hydrology as required by the Guidelines.	development characteristics. **Not considered a relevant environmental factor** Issues relating to Surface Water Quality and Wetlands are addressed under these factors
Wetlands	Wetlands - general	The proposed road crosses an extensive area of palusplain wetland. More than 150 wetlands listed in the Environmental Protection (Lakes) Policy 1992 are within 10 km and Ramsar wetlands are also in the vicinity of the proposal. Construction and implementation of the road may cause impacts on these wetlands due to changes in water quality and quantity.	• Some of our last remaining wetlands remaining on the coastal plain will be destroyed or further endangered by this proposal. With only 20% of our Coastal Plain wetlands remaining it is a disgrace to destroy any to build a new highway. • This proposal is inconsistent with the EPA phrase no loss of wetlands. • The loss of wetland from approving the road is inappropriate until the South West Wetlands EPP and CALM's State Wetlands Policy are complete. • Avoidance of wetland impacts is preferable, but where wetlands are impacted PIMA and WRC recommend the approach outlined in the United States Department of Transportation manual "Highways & wetlands, compensating wetland losses" should be used to compensate for wetland losses. • Concerned that MRWA has already reneged on wetland replacement in other projects, so cannot be trusted. • The criteria established by the Western Australian Water Resources Council (WAWRC) (in the Perth-Bunbury Region Report 1987) should have been used by the PER to assess the significance of wetlands along	**Considered a relevant environmental factor.**

Wetlands (cont)	Wetlands - general (cont)		• the route (The submission representing five submitters detailed the criteria) The road passes through the Mungala Wetland Suite identified as being of high to medium conservation value (WAWRC, 1987 Figure 5 pg 29). Given the location of the deviation on Palusplain, EPP and other wetlands will be interlinked through surface and ground water flows with the road, and as such will impact on the catchment of important wetlands. This interlinking is not addressed in the PER. • The road will form a levee across the Mungala wetlands directing all surface and ground water flow through aqueducts increasing speed of flow at these points increasing erosion, establishing more riverine systems and changing the ecosystem. It will also reduce nutrient loss in drainage and could affect important bird life in the estuary. The PER should have addressed flow management. It is inappropriate that the main transport artery for industrial chemicals, petroleum and other goods should go through a major wetland system. Rails would be safer. Protecting EPP wetlands is insufficient. Some of the most important habitats are closed vegetation wetlands which would not necessarily be protected by the proposed road alignment. Efforts should be made to avoid natural or semi natural basin wetlands and vegetated flat wetlands as described by the Water and Rivers Commission, in addition to avoiding EPP Wetlands. • Concerned that potential impacts on Lakes Mealup & McClarty not identified, especially as Lake Mealup is currently being rehabilitated. • Clause 13 (1) of the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 includes catchments and this has been ignored in the PER. • The 1995 report to the Australian Nature Conservation Agency "Guidelines for design of effective buffers for wetlands on the Swan Coastal Plain" should be used to determine wetland buffers. • It is essential that the WA Government determine whether or not the proposed route crosses the Ramsar area. The PER claims it does not, but this claim is not substantiated. • The State Government has not honoured its obligations under the Ramsar convention to consult the Commonwealth regarding this proposal. • We believe International treaties will be breached if this road proceeds as proposed as it impinges on their catchments.	
Watercourses	Wetlands - watercourses	The proposed road crosses the Murray and Harvey Rivers. These crossings may impact on the associated river foreshores.	• A foreshore management plan should be required for an appropriate areas to either side of any river crossing to the satisfaction of Peel Inlet Management Authority.	MRWA has provided a commitment to prepare foreshore management plans for the crossings on the Serpentine, Murray and Harvey Rivers (Commitment 12) **Not considered a relevant environmental factor**

Estuaries	Wetlands - Estuary - Peel-Harvey Estuary	The proposal is located within the catchment of the Peel-Harvey Estuary. Changes within the catchment, including clearing and altered drainage paths, may impact on the water quality of the Estuary.	• The proponents should assess the hydrological impacts of clearing deep rooted perennial vegetation (including "Cleared agricultural land) associated with the proposal with a view to revegetating at least as much as is cleared. This requirement would be consistent with the Statement of Planning Policy No 2 1992 The Peel-Harvey Coastal Plain Catchment.	The proponent has committed to the preparation and implementation of a Landscape and Rehabilitation Plan (Commitment 10). This plan would ensure that revegetation of the road reserve with native vegetation will be carried out and more vegetation than is removed would be replaced. **Not considered a relevant environmental factor.**
	Flood management	The proposed road crosses the Murray and Harvey Rivers. These crossings may alter the associated river flow characteristics.	• Design of bridges and river crossings should be consistent with Water and Rivers Commission advice and in accordance with Murray and Serpentine River Flood Studies. Note: A licence to construct is required from Peel Inlet Management Authority for bridge crossings. There is concern that the bridge across the Murray River is proposed on a power bend. The EMP should include flood management.	The proponent has committed to undertake design for road drainage according to best practice, including the maintenance of surface hydrology characteristics, (Commitments 1 & 4) to the satisfaction of the DEP and WRC. **Not considered a relevant environmental factor**
	POLLUTION MANAGEMENT			
Particulates/Dust	Particulates/Dust	Dust generation associated with the clearing and construction activities may impact on the adjacent residences.	• There is concern regarding the levels of heavy metals in the region. The Peel Deviation will increase airborne transmission of heavy metals.	The proponent has provided a commitment to prepare a construction management plan (Commitment 13) which includes the management of dust during construction. In a regional context the Peel Deviation will not increase the overall emission heavy metals from vehicle sources; although it will result in a change in the regional distribution. The increased efficiency of traffic flows expected as a consequence of constructing the Peel Deviation compared to that of existing inter-regional roads is likely to result in a net reduction of vehicle sourced emissions within the regional airshed based on existing traffic flows. Metals are predominantly removed from roads through adsorption onto particulate matter. Atmospheric deposition of highway generated pollution is generally limited to within 35m from the edge of the road pavement at traffic volumes of 116,000. Unlike other inter-regional roads that pass through more concentrated development, including residential, dispersal of particulates will be predominantly contained within the road reserve. **Not considered a relevant environmental factor.**

Greenhouse gasses	Greenhouse gasses	Use of the roadway may cause an increase in greenhouse gas emissions over other alternatives.	• The project should demonstrate compliance with the WA's Greenhouse Strategy which states we must "aim to reduce emissions from transport sources by 2005 through travel demand management, fuel and fuel substitution" (Recommendation 2b). This proposal seeks to satisfy demand, rather than manage it. There is no evaluation of alternative transport strategies from a Greenhouse Gas perspective as is required by the EPA Greenhouse Policy "Greenhouse gas emissions for specific projects". • We need to reduce greenhouse gas emissions. Rail will have less greenhouse effect. • A transport strategy for the South West should be adopted by the Department of Transport based on total cumulative and extrapolated greenhouse gas emissions.	The Southern Province Transport Strategy (1996) was prepared by the Department of Transport to provided an integration approach to the various components of the transport system in developing objectives and strategies for future transport requirements in the south west. The development of a strategy based on total cumulative and extrapolated greenhouse gas emissions is beyond the scope of the Peel Deviation PER. **Not considered a relevant environmental factor.**
Surface water quality	Water - surface water quality	The proposed road is located in an area that has extensive systems of constructed drains, includes two major river systems and a number of minor waterways discharging to the Peel-Harvey Estuary. Implementation of the proposal may result in changes to water quality in some or all of these waterways.	• It is not adequate to relegate details of the potential for containment of accidental spills of hazardous goods to a Drainage Management Plan. Given the interlinked nature of wetlands on a Palusplain, the proximity of significant wetlands to the road (including Ramsar listed wetlands), the fact that the road crosses 8 agricultural drains which lead directly to the Estuary and the poor ability of the soils to absorb pollutants it is not appropriate to defer details on this issue. Information should be provided also on the volume or type of materials travelling from Kemerton (particularly petroleum products) to determine proposed management measures. It is inappropriate for materials from Kemerton to pass through this wetland environment. • Kerbing would be needed to prevent run-off containing oils and greases, or spills reaching the palusplain. Significant drainage infrastructure would also be required (eg. pipe system of 600 l/s capacity per km of freeway, concrete (not HDPE which floats) lined basins to trap oils and greases, 3 m^3 of detention/m of freeway to provide 24 h detention) to treat drainage waters so that wetlands, particularly the significant wetlands nearby, are protected. The road reserve provides inadequate space for drainage. No details of emergency response for spills is provided. The PER ignores the need for specific drainage treatments and has not considered these costs, estimated at $10-11 million /km.	MRWA has provided commitments to manage surface water quantity and quality issues to the requirements of the Water and Rivers Commission (Commitments 1 & 4). In addition an outline of the proposed Surface Water Management Plan has been provided and commented upon by WRC. **Not considered a relevant environmental factor.**

Surface water quality (cont')			• More information on the effectiveness of drainage design features in preventing nutrients and heavy metals from reaching the environment is needed. What are the probabilities of failure? • How can the EPA assess the feasibility of management of pollution impacts from drainage when no indication of pollutant loads are given in the PER. If loads are known could use Duncan H P 1997 'Pollutant removal by storage: Analysis of Australian and overseas data' Water 24 1 p19 • How much stormwater - and of what quality - is likely to end up in the Murray & Serpentine River drainage systems? - And what are the acceptable criteria The proponent should be required to monitor turbidity increases & other water quality parameters on wetlands, rivers & streams (Section 6.4.1 of PER). There are no performance criteria. It is not satisfactory that this information is not in the PER.The proponents should be aware of the report "The use of bauxite residue as a soil amendment in the Peel Harvey Coastal Plain Catchment" which suggests that pollutants associated with urbanisation and particularly those related to transport, have the potential to impact significantly on the Peel-Harvey Estuary.	
Noise		Noise generated during construction activities may affect adjacent residences. Noise generated by vehicle use of the completed route may affect residences including those in the adjacent Lakelands and Murray Lakes estates.	• No submissions received on this factor.	Construction noise would also be controlled under the ***Environmental Protection (Noise) Regulations 1997.*** **Construction noise is not considered a relevant environmental factor.** **Operational noise is considered a relevant environmental factor**
	SOCIAL SURROUNDINGS			
Public health and safety	The route would be used in the transport of hazardous goods.		• No submissions received on this factor.	The proponent would design and construct the road according to standards specified by Ausroads to minimise the risk of accidence occurring that may cause spillage of hazardous goods. Transport requirements and emergency response procedures for Hazardous Goods are also defined by regulations under the Explosives and Dangerous Goods Act 1961. **Not considered a relevant environmental factor.**

Visual amenity	Visual amenity	Construction of the route would involve some clearing, construction of bridges over water courses and creation of a road base which may detract from visual amenity.	• Where landscape values are high (eg. at the National Park) a proper landscape study is required. The PER does not address this aspect adequately. The current works at Myalup detract from landscape values.	The proponent recognises that the most significant impacts on visual amenity are likely to be associated with clearing of vegetation. The main area of this impact is likely to be where the alignment traverses the hill to the west of Doman Road. The proponent proposes to prepare and implement a landscape and rehabilitation plan (Commitment 10) to minimise visual impacts associated with the proposal. **Not considered a relevant environmental factor.**
Aboriginal culture and heritage Heritage	Heritage	The proposed route passes close to the Yunderup Aboriginal Site at the Murray River crossing and through the eastern portion of a site nominated as the Doman Road Camp and Water Source.	• No mention of June 1976 Peel Preston Study Aboriginal Heritage findings (See pages 2 &6). • Figure 6a omits two known aboriginal ethnographic sites from the map. • Figure 6a omits a major section of bridle trail from Rogers Rd to Fiegerts Rd, and a replacement route is needed here.	The proponent has provided a commitment (Commitment 17) to ensure all necessary clearances are obtained from the Aboriginal Affairs Department prior to construction. **Not considered a relevant environmental factor.**

3.2 Vegetation Communities

3.2.1 Description

The proposal is predominantly located within cleared farmland to the east of the Peel Harvey Estuary. Clearing of some remnant vegetation and an area of pine plantation will be required for construction of the road. The total area of vegetation affected by the proposal is summarised in Table 3.

Table 3: Area of vegetation affected by the proposed road reserve (100 m).

	Area (ha)	Proportion of road reserve (%)
Parkland Cleared Farmland	375	72
Pine Plantation	37	8
Native Vegetation	110*	20
Total Area	**522**	**100**

*It is likely that only 50-60 m of the 100 m road reserve would be required for the construction of the dual carriageway. On this basis 66 ha of native vegetation is likely to be affected by the proposal rather than 110 ha as indicated in Table 3.

There are six areas of vegetation that would be impacted by construction of the road which may be considered significant:

- Serpentine River crossing (System 6 M108)
- Murray River Crossing
- Threatened Ecological Community north of the Harvey River (Location 1409)
- Harvey River Crossing
- Clifton Management Priority Area (MPA) (System 6 C55)

  (Proposed National Park)
- McLarty MPA (System 6 C56)

  (Proposed National Park)

3.2.2 Proposed management

To manage the impacts on native vegetation MRWA proposes to:

- replace more vegetation in the implementation of the landscaping/rehabilitation plan than is impacted by the proposal (Commitment 10)
- use local native vegetation species in the landscaping/rehabilitation (Commitment 10)

- clear only that portion of the road reserve critical for the road construction and operation (Commitment 6)
- review the Declared Rare and Priority Flora listing just prior to construction (Commitment 6)
- prepare foreshore management plans for the river crossing points (Commitment 12)

The implementation of Commitment 10, which relates to rehabilitation of the road reserve, would result in 150 ha of revegetation being established in the road reserve along the length of the proposal to achieve a net gain of 84 ha.

3.2.3 Assessment

The DEP has advised that in excess of 90% of vegetation on the heavier Pinjara Plain soils of the Swan Coastal Plain has been cleared. As a consequence all remaining bushland on these soils is likely to have significant conservation value.

Serpentine River Crossing

The crossing of the Serpentine River is highly constrained by the location of the southern end of the Kwinana Freeway and an existing residential subdivision (Lakelands estate). A corridor for the Peel Deviation has been provided as part of the residential subdivision (see Figure 2). These features have significantly limited the options for crossing of the Serpentine River.

The proposed crossing point of the Serpentine River is to the north of Stake Hill Bridge in a complex area of fresh, brackish and saline wetlands and upland vegetation. This section of the Serpentine River is identified in System 6 as M108 (Goegrup Lakes) and it is recognised that there may be some impacts due to Perth-Bunbury Highway (DCE, 1983).

Construction of the road would impact on the fringing vegetation on the Serpentine River which includes *Melaleuca pauciflora* heath samphire, and *Kunzea ericifolia/Jacksonia furcellata* heath and *Casurina obesa/Meleuca cuticularis* low riparian forest.

The area adjacent to the river crossing (see Figure 2) is proposed 'Regional Open Space' under the draft Peel Region Scheme and includes representation of the vegetation communities that would be affected by the construction of the road. Impacts on vegetation at the Serpentine River crossing would be due to construction of the bridge abutments on either side of the river and construction of the bridge and associated piers crossing the river.

Vegetation under the bridge structure is likely to be removed during the construction process and will not regenerate due to a combination of shading and dry soil conditions.

The rehabilitation and management of areas of vegetation affected by bridge construction over the Serpentine River would be addressed in management plans developed by the proponent (Rehabilitation and Landscape Plan - Commitment 10 and Foreshore Management Plan - Commitment 12).

The alignment across the Serpentine River is accepted as the best available given the constraints imposed by existing development and considering commitments to minimise impacts at the river crossing (Commitment 6), prepare foreshore management plans (Commitment 12), revegetate with native species (Commitment 10) and representation of

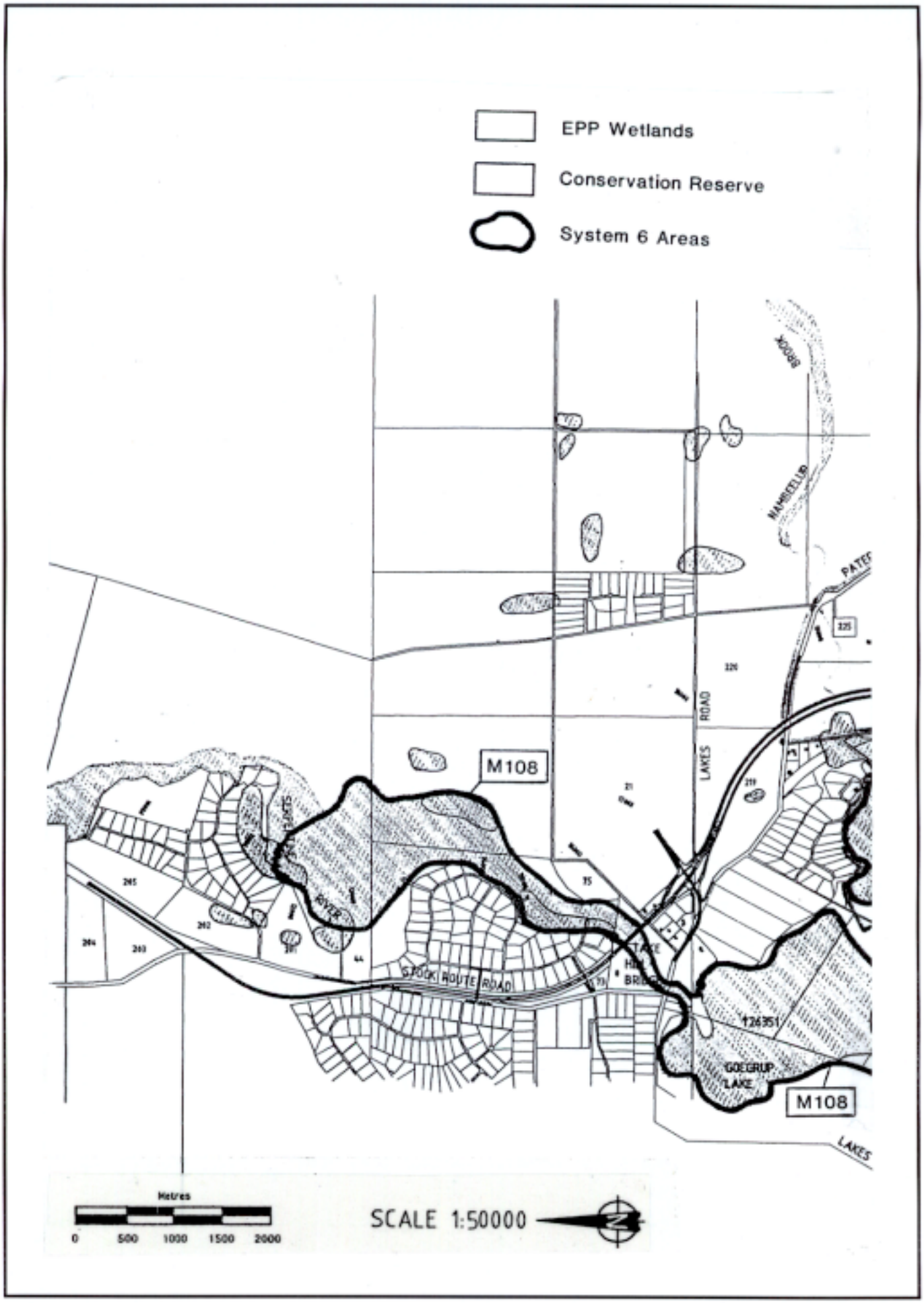

Figure 2. Alignment of the Peel Deviation near the Serpentine River.

affected vegetation communities in the adjacent area identified as 'Regional Open Space' under the draft Peel Region Scheme.

Murray River Crossing

MRWA preferred alignment crosses the Murray River in a location that is constrained by existing subdivision (Murray Lakes estate) and sites of Aboriginal significance to the east. The crossing is at a narrow point on the river and is considered acceptable providing the constructed road is located as far west as possible to minimise impacts on the secondary river channel and vegetation that extends into the eastern portion of the alignment.

Threatened Ecological Community north of the Harvey River(Location 1409)

The vegetation on Location 1409 is an isolated remnant of bushland within the largely cleared Pinjarra Plain. This remnant of approximately 15 ha lies within an area of the Cannington Vegetation Complex of Heddle *et al* (1980) and is described as a 'mosaic of vegetation from adjacent vegetation complexes of Bassendean, Karrakatta, Southern River and Vasse' (Trudgen, 2000).

A vegetation site survey conducted during August 2000 identified six vegetation units (plant communities) representing at least four different vegetation associations within Location 1409 (Trudgen, 2000). These units (see Figure 3) include:

Unit 1: Scattered trees of *Eucalyptus marginata* over *Banksia attenuata*, *Banksia ilicifolia* low woodland over *Melaleuca thymoides* shrubland/high shrubland over *Xanthorrhoea preissii* shrubland over *Hypocalymma angustifolium* low open shrubland over *Dasypogon bromeliifolius* open herbland.

Unit 2: Scattered low trees of *Banksia ilicifolia* and *Banksia attenuata* over scattered tall shrubs of *Xanthorrhoea preissii* over *Melaleuca thymodies* shrubland over *Hypocalymma angustifolium* low open shrubland over *Dasypogon bromeliifolius*, *Hypolaena exsulca* open herbland/sedgeland.

Unit 3a: *Corymbia calophylla* open forest over scattered low trees of *Melaleuca preissiana* over *Xanthorrhoea preissii* low shrubland/shrubland to open heath over *Cyathochaea avenacea* sedgeland.

Unit 3b: *Corymbia calophylla, Eucalyptus marginata* open forest over *Xanthorrhoea preissii* low shrubland/shrubland to open heath over *Dasypogon bromeliifolius* herbland.

Unit 4: *Melaleuca preissiana* open woodland over *Regelia ciliata* open heath over *Hypocalymma angustifolium* low open shrubland.

Unit 5: *Melaleuca preissiana* open woodland over *Acacia pulchella* open shrubland over *Hypocalymma angustifolium* low shrubland to low open heath *Hypolaena exsulca* low open sedgeland.

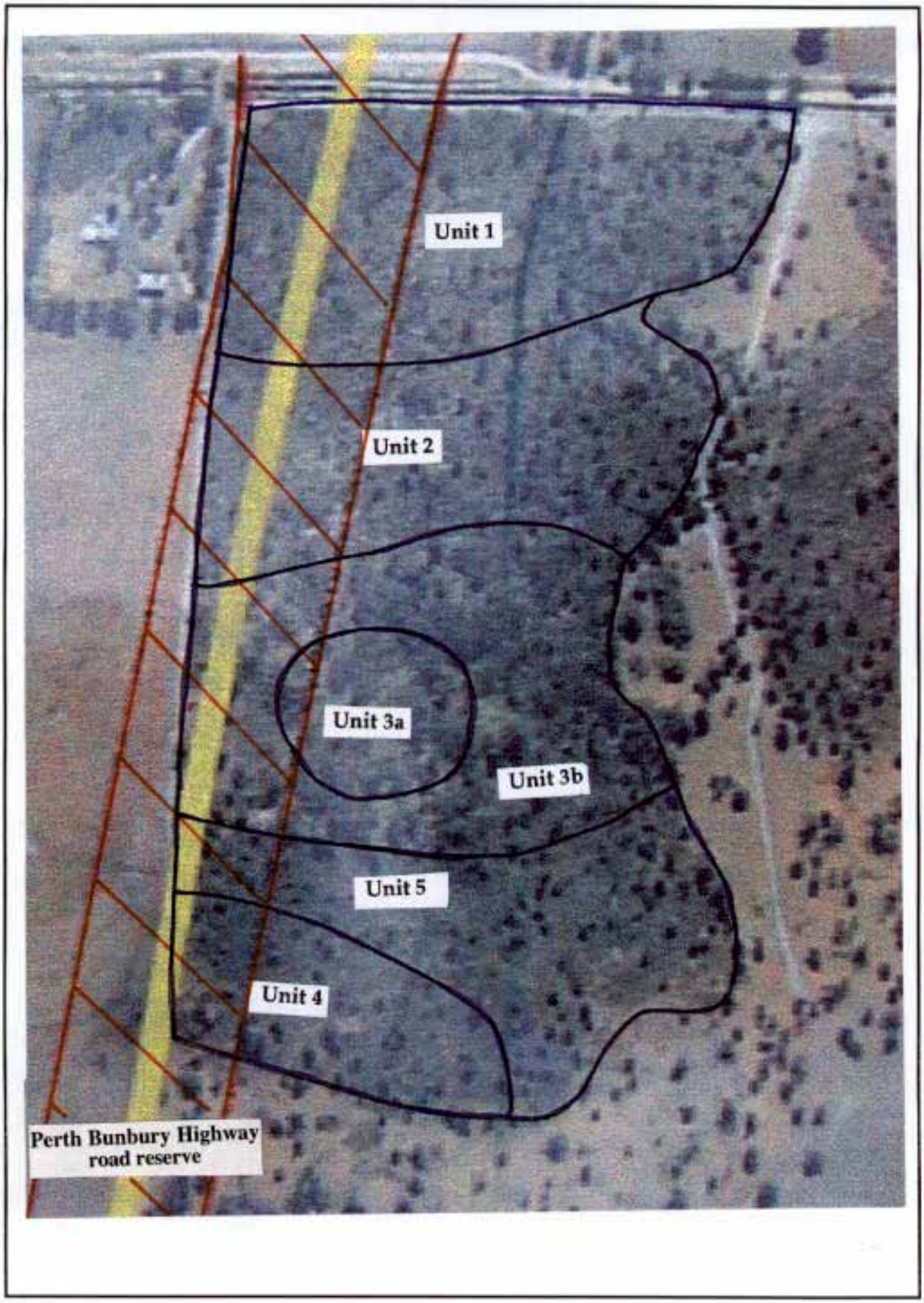

Figure 3. Vegetation units within Location 1409 as described by Trudgen (2000).

At the time of the survey the vegetation in the remnant was mostly in good condition or good to very good condition, except for Unit 3b which was partly in poor to good condition and partly in good condition. Some small areas were in poor condition and others in very good condition. The lowering of condition appears to reflect past grazing however, the area does not appear to have been grazed to any significant extent at present or in the recent past (Trudgen, 2000).

Trudgen (2000) considers the vegetation has significant conservation value due to the extent of clearing in the surrounding region. This value is assigned partly due to the overall size of the remnant and partly due to the diversity of vegetation within the remnant (six plant communities-vegetation units).

Vegetation Unit 3a of Trudgen (2000) is considered comparable to Floristic Community Type 3b of Gibson *et al* (1994). However, until a plot can be recorded in spring or early summer to obtain a more complete species list and computer comparison of the list with Gibson *et al* (1994) the allocation is not definitive. Community 3b is a Threatened Ecological Community (English and Blyth, 1997) and is classified as vulnerable.

The proposed road reserve impacts on the western side of the remnant. The degree of impact ranges from the full reserve width of 100 m at the northern boundary to approximately half the road reserve width (50 m) on the southern boundary of the remnant. All vegetation units discussed above are impacted by the proposed road reserve (see Figure 3). The impact on Community 3a of Trudgen (2000), by the construction of the road is likely to be minimal and could possibly be avoided by giving particular attention to the location of the road within the road reserve.

Construction of the road within the road reserve is not likely to require clearing of the complete road reserve. However, in the absence of a definitive statement from MRWA on the actual area that would be disturbed during construction, a conservative approach should be adopted and the assumption made that full road reserve width would be affected.

On the basis of the above discussion the EPA considers the alignment of the Peel Deviation in the vicinity of Location 1409 needs to be managed to be made environmentally acceptable by adopting one of the following three options:

<u>Maintenance of the current alignment with a specific vegetation compensation package</u>

MRWA's preferred alignment could be made environmentally acceptable provided that an adequate Vegetation Compensation Package is developed.

The Vegetation Compensation Package would consider:

- the biological and environmental values of any vegetation to be impacted by the proposed alignment within the Threatened Ecological Community components of the remnant on Location 1409;
- the potential for realignment of the route, avoid or minimise impacts on the Threatened Ecological Community components of the remnant on Location 1409; and
- measures, including the possible acquisition of other vegetated land, to mitigate the loss of any biological and environmental values caused by the road.

In considering the suitability of other vegetated land to mitigate the loss of any biological and environmental values caused by the road within the Threatened Ecological Community components of the remnant on Location 1409, the EPA would be particularly cognisant of the:

- specific vegetation communities affected by the road;
- specific vegetation communities on land proposed for acquisition to mitigate the loss of biological and environmental values caused by the road; and the
- values and role of this vegetation in maintaining conservation values of the Peel Harvey Region.

Maintenance of the current alignment with detailed design to avoid impacts on Threatened Community Type 3b

MRWA's preferred alignment could be made environmentally acceptable providing the detailed design and construction of the road can ensure that impacts on the area identified as Threatened Community Type 3b are avoided.

The detailed design and construction phases of the project would consider:

- the biological and environmental values of any vegetation to be impacted by the proposed alignment within the Threatened Ecological Community components of the remnant on Location 1409;
- the potential detailed design of the road to avoid impacts on the Threatened Ecological Community components of the remnant on Location 1409; and
- measures, including revegetation of the road reserve, to minimise impacts on the remainder of the remnant due to construction and operation of the road.

Realignment predominantly within cleared farmland

The alignment could be realigned such that it is predominantly located within cleared farmland. It is understood that such realignment may prove difficult to achieve given recent development approvals adjacent to the Peel Deviation route to the north of Location 1409. This is an option that should not be discarded as it would minimise impacts on the remnant within Location 1409.

Harvey River crossing

The location of the Harvey River crossing coincides with one of the few vegetated blocks remaining on the river. While this vegetation is not in exceptional condition it does represent one of the few remaining opportunities for conservation of vegetation on the Harvey River. The southern side of the river crossing is a 'Camping Reserve' vested in the Local Authority and is identified as 'Regional Open Space' under the draft Peel Region Scheme (WAPC 1999). The position of MRWA preferred alignment through this reserve would fragment the vegetation into east and west portions.

In adopting this alignment MRWA is prepared to negotiate the purchase of the severed portion of land on the northern side of the River. This land is vegetated and could be considered an adequate offset to the fragmentation and loss of vegetation on the southern side of the River providing this land is retained for conservation. This would be an acceptable outcome for the crossing of the Harvey River.

Clifton and McLarty Management Priority Areas

The location of MRWA preferred alignment through the eastern edge of the Clifton and McLarty Management Priority Areas (MPA) (System 6 areas C55 and C56 respectively) is of concern. The alignment fragments the eastern edge of a vegetation complex that extends across several soil types. The alignment also severs the connection between the Clifton and McLarty MPAs and causes fragmentation of the McLarty MPA's (see Figure 4).

The Clifton and McLarty MPAs are listed in the System 6 reports as regionally significant vegetation due to their high conservation and recreation values, close proximity to Perth and Bunbury and neighbouring rural districts (DCE, 1983). Both MPAs are proposed to be incorporated into Yalgorup National Park.

The Clifton MPA includes forest types that continue to be cleared on the Coastal Plain. The shallower sands overlying limestone carry open forest of tuart with an understorey of peppermint while deeper sands carry a mixture of jarrah and slender banksia. There are few extensive stands of tuart and peppermint available for recreation within the System 6 area (DCE, 1983).

The McLarty MPA comprises a long narrow strip of land containing open-forest of tuart with an understorey of peppermint which helps to compliment the nearby disjointed areas of tuart-peppermint forest contained in the Yalgorup National Park, Clifton MPA and Myalup MPA (DCE, 1983).

CALM has advised that an alignment predominantly through cleared farmland to the north of Doman Road extending generally through Locations 812 and 814 before taking a single sweep to the west around Coronation Road to meet Old Coast Road would be a more suitable alignment and is therefore preferred. This would minimise the clearing of remnant vegetation and the ongoing impact of the road on nature conservation values. DEP supports this alternate alignment.

CALM also indicated, however, that it did not object to MRWA proposed alignment provided tight controls were put in place and the MRWA implemented measures to replace vegetation values lost as a result of the chosen alignment.

It is also noted that the potential for impacts on the vegetation in the Clifton MPA (System 6 C55) due to the widening of Old Coast Road and future highway between Perth and Bunbury has been recognised in both the System 6 Red Books (DCE, 1983) and Yalgorup National Park Management Plan (CALM, 1995).

On the basis of the above discussion the EPA considers the alignment of the Peel Deviation between the Harvey River and Old Coast Road could be made environmentally acceptable by adopting one of the following three options:

<u>Maintenance of the Current Alignment with a specific compensation package</u>

In recognition of the strategic planning for the region, and consideration of the proposal in System 6 Reports (DCE, 1983) and the management plan for Yalgorup National Park

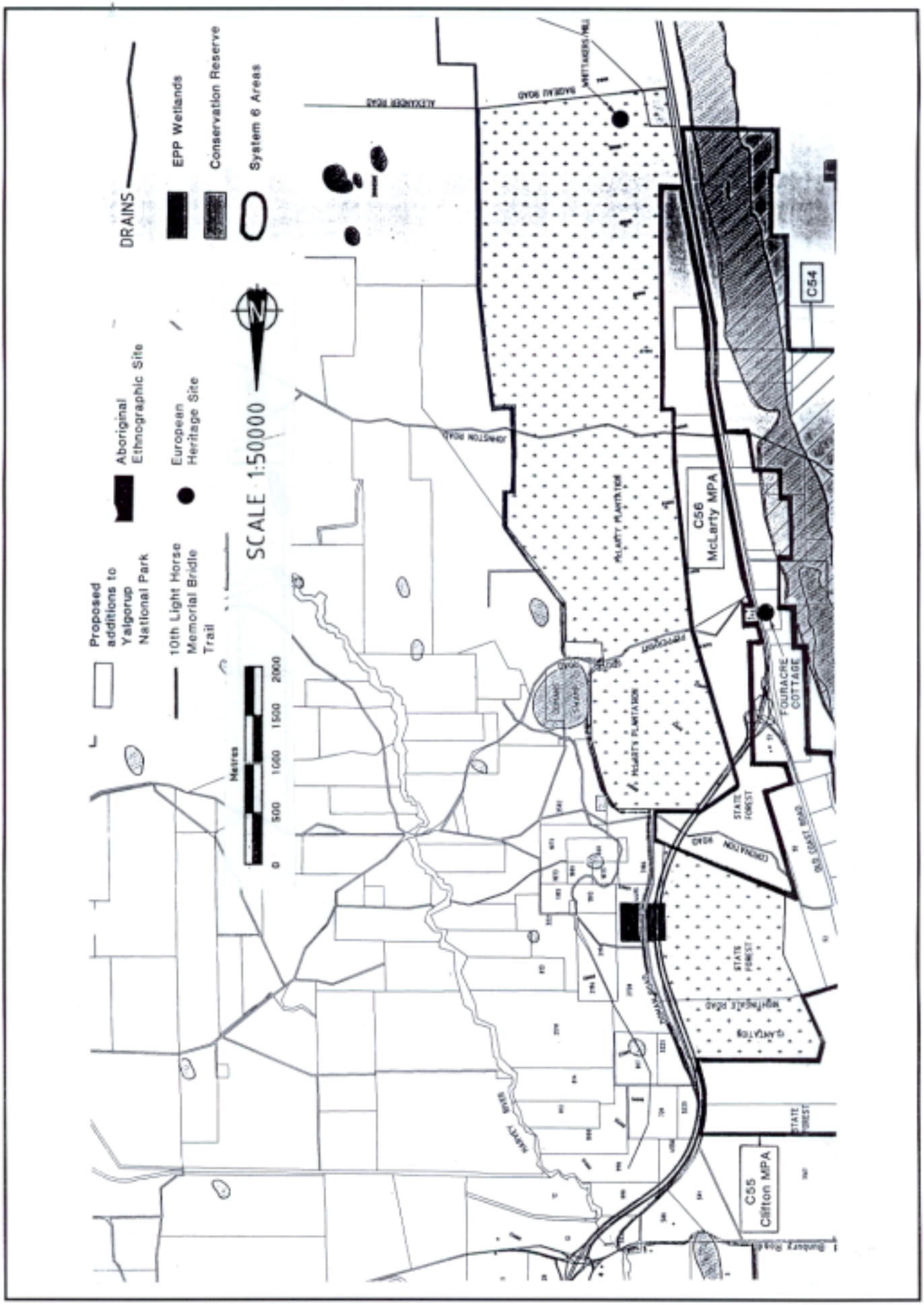

Figure 4. Alignment of the Peel Deviation through the Clifton and McLarty MPAs.

(CALM, 1995) the MRWA preferred alignment could be made environmentally acceptable providing an adequate Vegetation Compensation Package is developed.

The Vegetation Compensation Package would consider:

- the objectives for management of the Clifton and McLarty Management Priority Areas and Yalgorup National Park;
- the potential for realignment of the route and design of the road to as far as practicable, avoid or minimise impacts on the Clifton and McLarty Management Priority Areas;
- the biological and environmental values of any vegetation to be impacted by the proposed alignment and road design within the Clifton and McLarty Management Priority Areas; and
- measures, including the possible acquisition of other vegetated land, to mitigate the loss of any biological and environmental values caused by the road.

In considering the suitability of other vegetated land to mitigate the loss of any biological and environmental values caused by the road within the Clifton and McLarty MPA's, the EPA would be particularly cognisant of the:

- specific vegetation communities affected by the road;
- values and role of this vegetation in establishing and maintaining the conservation values of the proposed National Park;
- specific vegetation communities on land proposed for acquisition to mitigate the loss of biological and environmental values caused by the road; and the
- values and role of this vegetation in establishing and maintaining the conservation values of the proposed National Park.

Realignment to the east along the alignment of Domain Road

This alignment would result in the clearing of some vegetation however the majority of this vegetation would be of lesser value than that in the Clifton MPA or the connecting corridor of vegetation between the Clifton MPA and McLarty MPA located to the west of Domain Road.

This alignment could be made environmentally acceptable if an equivalent area of vegetation to that impacted within the McLarty MPA were to be acquired and ceded to the conservation estate as part of a Vegetation Compensation Package.

Realignment to the east predominantly within the cleared farmland

This alignment would be approximately consistent with the MRWA Southern 2 alignment option as detailed in the PER. Some clearing of remnant vegetation would still be required however the alignment could be revised to further reduce clearing and limit this clearing to a degraded area of vegetation just to the north of Coronation Road. In adopting this alignment the connection to Old Coast Road could be substantially located within the McLarty Pine Plantation with minimal impacts on the eastern portion of the McLarty MPA. There would be some unavoidable impacts on the McLarty MPA where the alignment exits the pine plantation to join with Old Coast Road.

This alignment would also enable modification of the crossing point of the Harvey River to avoid impacts on the significant bushland at this point.

This alignment could be environmentally acceptable without the need for acquisition of an equivalent area of vegetation under the Vegetation Compensation Package.

3.2.4 Summary

The EPA's objective for vegetation communities is to maintain the abundance, species diversity, geographic distribution and condition of vegetation communities. In addition the EPA's objective for System 6 recommended areas is to ensure the conservation values are not compromised and that regionally significant flora and vegetation communities in System 6 is adequately protected.

Three areas along the proposed alignment with significant conservation values would be affected, Location 1409 and Clifton and McLarty MPA's. In each case, the EPA has outlined options which could protect and mitigate impacts on these values.

Having particular regard to the:

- MRWA commitments
- the significance of vegetation impacted along the alignment
- the proposed Ministerial Conditions for a Vegetation Compensation Package

it is EPA's opinion that the proposal can be designed and managed to meet the EPA's environmental objectives for this factor.

3.3 Declared Rare Flora

3.3.1 Description

As part of the environmental investigations for the proposal MRWA undertook a survey for Declared Rare and Priority Flora (DR&PF). This survey recorded vegetation species at representative sites in the vicinity of the proposed route during late November 1996. Three hundred and forty-five vascular plants were identified from 202 genera belonging to 67 families. None of these species were listed as Declared Rare Flora however one Priority Flora species, *Lasiopetalum membranaceum* (Priority 2), was identified near the southern end of the alignment immediately west of the Old Coast Road within *Eucalyptus gomphocephala/Agonis flexuosa* woodland.

3.3.2 Proposed management

Given the possible extended period between approval and actual construction MRWA has recognised that the species on the DR&PF list may be updated. MRWA therefore proposes to review the DR&PF list prior to construction of the road (Commitment 6) to identify any changes to the listing and compare this to the species identified during the vegetation survey undertaken as part of the environmental investigations for the PER. Any necessary clearances can then be obtained prior to construction activities.

3.3.3 Assessment

As the vegetation survey was undertaken in late spring there is a strong possibility that *Boronia juncea* subsp. *juncea* (currently listed as Priority 1) would not have been identified even if individuals were present. This species may be present on the alignment (Mattiske 1998a & b). In addition, the use of representative locations in the vicinity of the alignment to identify DR&PF rather than surveying the actual alignment increases the probability that DR&PF species on the alignment may have been overlooked.

The EPA believes that a comprehensive DR&PF survey during spring should be undertaken as a matter of priority to determine the location of any DR&PF on the actual alignment. The survey should be timed to coincide with the flowering season of *Boronia juncea* subsp. *juncea* and be conducted along the entire length of the proposed alignment. The EPA recommended that this become the subject of an environmental condition.

3.3.4 Summary

The EPA's objective for this factor is to protect Declared Rare and Priority Flora, consistent with the provisions of the *Wildlife Conservation Act 1950*.

Having particular regard to the:

- MRWA commitments; and
- recommended Environmental Condition requiring a Declared Rare and Priority Flora survey during early spring and measures to protect DR&PF populations found,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

3.4 Wetlands

3.4.1 Description

The proposed road crosses an extensive area of palusplain wetland to the east of the Peel Harvey Estuary, Lake Clifton and Lake Yalgorup. In addition road construction would impact one wetland classified as Conservation Category wetlands at the Serpentine River Crossing. The proposal does not impact on any wetlands protected under the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*.

3.4.2 Proposed management

MRWA has made a number of commitments that are related to the management of impacts on wetlands:

- design and implement roadside drainage to Water and Rivers Commission requirements (Commitment 4)
- ensure the roadside drainage has the capacity to contain spills (Commitment 4)
- prevent direct discharge of stormwater to the adjacent environment (Commitment 4)
- minimise impacts on wetlands (Commitment 5)
- preparation of foreshore management plans (Commitment 12)

3.4.3 Assessment

Advice from the Water and Rivers Commission indicates it is satisfied with the proposed drainage management arrangements. MRWA has also incorporated the requests made by the Peel Inlet Management Authority (PIMA) during the public consultation phase of the assessment (Commitments 4 & 10).

DEP advises that impacts on wetlands can be managed to achieve the EPA's objective.

3.4.4 Summary

The EPA's objective for wetlands is to maintain the integrity, functions and environmental values of wetlands.

Having particular regard to the:

- MRWA commitments
- the degree of significance of wetlands impacted by the preferred alignment

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

3.5 Traffic Noise

3.5.1 Description

There are two residential estates (Lakelands and Murray Lakes) and a number of individual residences in relatively close proximity to the proposed road that may be adversely affected by traffic noise. These residential areas currently experience moderate noise levels.

There are 14 and 22 houses in the Lakelands and Murray Lakes estates respectively as well as nine individual residences within 135 m of the proposed route. MRWA has calculated that 135 m is the distance within which its noise policy of 63 dB(A) $L_{10\ (18\text{-hour})}$ would be exceeded during operation of the road.

3.5.2 Proposed management

At the time of construction the road would be designed to achieve noise levels consistent with MRWA Traffic Noise Policy as agreed with DEP and EPA at the time (Commitment 3).

3.5.3 Assessment

The impact of traffic noise from major highways on adjacent noise sensitive premises such as residential housing is a significant issue that has not been adequately resolved by State government agencies.

The EPA is of the opinion that the impact of traffic noise on night-time noise levels for noise sensitive premises is a major concern. Current MRWA policy on noise impacts is based on the use of $L_{10\ (18\text{-hour})}$ criteria. However, this criteria does not take adequate account of night-time noise levels in that it does not consider noise impacts between midnight and 6 AM.

In a recent assessment of proposed transport corridors in the Perth Metropolitan Area (EPA, 2000) the EPA has indicated that a night-time noise level of 35 dB(A) $L_{Aeq\ (internal)}$ should be achieved for noise sensitive premises. The EPA favours the use of $L_{Aeq\ (internal)}$ criteria as a

measure of noise impacts on noise sensitive premises as this measure takes greater account of night-time noise levels. The use of $L_{Aeq\ (internal)}$ allows for the greatest range of ameliorative measures to achieve compliance with the required levels. These ameliorative measures may include treatments for individual residences such as double glazing and specific window treatments. The EPA recognises that MRWA does not have the statutory authority to implement ameliorative treatments in areas outside the road reserve and consequently would look favourably on the development of an equivalent external measure of noise.

At the time of this assessment MRWA is in the process of reviewing its traffic noise policy and that this includes consultation with stakeholders such as the EPA and DEP. In consideration of this review, and the extended period of time (>5 years) before the road is likely to be constructed, the EPA is confident that an agreed position for the management of impacts due to traffic noise can be achieved. It is expected that this agreed position, which would be reflected in a revised MRWA policy on the management of traffic noise, would take into account the EPA's views on the impact of night-time noise levels on noise sensitive premises.

Consequently the EPA has concluded that traffic noise can be adequately managed at the time of construction to ensure the impact on noise sensitive premises meets accepted levels. In making this conclusion the EPA is aware of the possibility that applications for development proposals which may include noise sensitive premises adjacent to the proposed road alignment may be lodged prior to construction of the road or an agreed position on the management of traffic noise. When considering these applications decision making authorities should take adequate account of the potential for traffic noise from the Peel Deviation and adopt a conservative position until an agreed policy on the management of traffic noise is achieved (see Other Advice Section 4).

3.5.4 Summary

The EPA's objective for this factor is to protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring that noise levels meet statutory requirements and acceptable standards.

Having particular regard to:

- MRWA commitments;
- MRWA's current review of its noise policy;
- the EPA's view of acceptable impacts on existing noise sensitive land uses; and
- recommended Environmental Condition on traffic noise,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

4. Conditions and commitments

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

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

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

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

Proponent's commitments

The proponent's commitments as set in the PER and subsequently modified, as shown in Schedule 2 and included in Appendix 3, should be made enforceable. These include a:

- surface water management plan
- vegetation management plan
- dieback management plan
- rehabilitation and landscape plan
- fauna management plan
- foreshore management plan
- construction management plan

Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by MRWA, to construct an inter-regional road on the eastern side of the Peel-Harvey Estuary to bypass Mandurah, is approved for implementation.

These conditions are presented in Appendix 3. Matters addressed in the conditions include the following:

- a spring survey for Declared Rare and Priority Flora
- vegetation compensation package
- a noise management strategy for operational noise.
- that the proponent be required to fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3.

Other Advice

In addition to the recommended conditions and proponent's commitments the EPA advises planning agencies that when considering development applications for noise sensitive premises, adjacent to the Peel Deviation alignment, prior to construction of the road or an agreed position on the management of traffic noise, consideration should be given to the potential for traffic noise from the Peel Deviation. A conservative position should be adopted in terms of buffer distance to the road alignment until an agreed policy on the management of traffic noise is achieved.

5. Conclusions

The EPA has considered the proposal by MRWA to construct an inter-regional road on the eastern side of the Peel-Harvey Estuary to bypass Mandurah.

The EPA notes that:

- the proposal has been identified in planning documents for the Peel Region since the 1980s;
- the northern section of the alignment (north of the Murray River) is highly constrained by the location of the southern extend of the Kwanina Freeway and existing urban subdivision including Lakelands and Murray Lakes estates;
- the central portion of the alignment is predominantly located within cleared farmland;
- the alignment has been selected to minimise impacts on wetlands to the extend that no EPP wetlands are impacted and only one wetland of conservation significance (at the Serpentine River crossing) is affected;
- the southern section of the alignment (south of the Harvey River) impacts on vegetation contained within an area identified as proposed National Park;
- the management plan for Yalgorup National Park and the System 6 reports recognise that the proposal may impact on vegetation within the proposed National Park;
- MRWA is currently undertaking a review of its policy on operational traffic noise in consultation with stakeholders including the EPA and DEP; and
- the road is not likely to be constructed for at least five years.

The EPA has concluded that the proposal is capable of being designed and managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 3 and summarised in Section 4, including the proponent's commitments.

6. Recommendations

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

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

- That the Minister notes that the project being assessed is for Main Roads Western Australia to construct an inter-regional road on the eastern side of the Peel-Harvey Estuary to bypass Mandurah.;
- That the Minister considers the report on the relevant environmental factors as set out in Section 3;
- That the Minister notes that the EPA has concluded that the proposal can be designed and managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 3 and summarised in Section 4, including the proponent's commitments;
- That the Minister imposes the conditions and procedures recommended in Appendix 3 of this report.

Appendix 1

List of submitters

Organisations:

Agriculture WA
Department of Conservation and Land Management
Environment Australia
National Parks and Nature Conservation Authority
Ministry for Planning
Peel Development Commission
Water and Rivers Commission
Water Corporation

Birds Aust (WA Gp)
Coalition Environment Groups
Peel Preservation Group
Waterbird Conservation Group
Wildflower Soc WA
CCWA

Individual:

N Brockman
T L Butcher
M Campbell
A Herlihy
Kelliher Bros
F Lake
M Lake
R R Lake
S Lake
M Mannion
R McKay
D Matthews
O Mueller
Murdoch Br.
C A Mercer
K McLean
P Wilmot
S and M Telford
A Thomson
E Tyler
R and D Tyler
V M Wells

Appendix 2

References

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Appendix 3

Recommended Environmental Conditions and

Proponent's Consolidated Commitments

Recommended Environmental Conditions

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

PERTH-BUNBURY HIGHWAY, PEEL DEVIATION

Proposal: To construct an inter-regional road on the eastern side of the Peel-Harvey Estuary, bypassing Mandurah, extending from the southern most portion of the proposed Kwinana Freeway at Stock Road, to the existing Perth-Bunbury Highway (Old Coast Road), approximately 2.5 kilometres north of Johnston Road, as documented in schedule 1 of this statement.

Proponent: Main Roads Western Australia

Proponent Address: xxx
xxx
xxx

Assessment Number: 786

Report of the Environmental Protection Authority: Bulletin 995

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

Procedures

1 Implementation

1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 Proponent Commitments

2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of conditions and procedures in this statement.

3 Proponent

3-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.

3-2 Any request for the exercise of that power of the Minister referred to in condition 3-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.

3-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

4 Commencement

4-1 The proponent shall provide evidence to the Minister for the Environment within ten years of the date of this statement that the proposal has been substantially commenced.

4-2 Where the proposal has not been substantially commenced within ten years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.

4-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond ten years from the date of this statement at least six months prior to the expiration of the five year period referred to in conditions 4-1 and 4-2.

4-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding ten years for the substantial commencement of the proposal.

5 Compliance Auditing

5-1 The proponent shall submit periodic Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.

5-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal written advice that the requirements have been met.

5-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment.

Conditions

6 Declared Rare and Priority Flora

6-1 At least twelve months prior to construction, the proponent shall undertake a spring survey for Declared Rare and Priority Flora along the proposed route, to the requirements of the Environmental Protection Authority on the advice of the Department of Environmental Protection and the Department of Conservation and Land Management.

7 Traffic Noise

7-1 Prior to ground disturbing activities, the proponent shall prepare a Traffic Noise Management Plan to address the impact of post-construction traffic noise on the amenity of adjacent residences and residential areas, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

The Traffic Noise Management Plan shall include consideration of:

1) acceptable noise levels, as agreed between the Main Roads Western Australia and the Department of Environmental Protection, to protect the amenity of adjacent residences; and

2) measures to manage the impact of traffic noise on adjacent residences and residential areas.

7-2 The proponent shall implement the approved Traffic Noise Management Plan required by condition 7-1.

8 Threatened Ecological Community

8-1 Prior to ground-disturbing activities, the proponent shall prepare a Vegetation Compensation Package to off-set the impacts on any Threatened Ecological Community including Floristic Community Type 3 to the North of the Harvey River Crossings, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection and Department of Conservation and Land Management.

The Vegetation Compensation Package shall consider:

1. the biological and environmental values of any vegetation to be impacted by the proposed alignment and design of the road;

2. a review of the alignment of the route or design of the road, to avoid or minimise impacts on the vegetation; and

3. measures, including the possible acquisition of other vegetated land, to mitigate for the loss of any biological and environmental values caused by the road.

8-2 Prior to ground disturbing activities, the proponent shall implement the approved Vegetation Compensation Package required by condition 8-1, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection and Department of Conservation and Land Management.

9 Alignment south of the Harvey River

9-1 Prior to ground-disturbing activities, the proponent shall prepare a Vegetation Compensation Package for the section of the alignment between the Harvey River and the Old Coast Road, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection and Department of Conservation and Land Management.

The Vegetation Compensation Package shall consider:

1. the objectives for management of the Clifton and McLarty Management Priority Area;

2. a review of the alignment of the route and design of the road to as far as practicable to avoid or minimise impacts on the Clifton and McLarty Management Priority Areas;

3. the biological and environmental values of any vegetation to be impacted by the proposed alignment and road design within the Clifton and McLarty Management Priority Areas; and

4. measures, including the possible acquisition of other vegetated land, to mitigate the loss of any biological and environmental values caused by the road.

9.2 Prior to ground disturbing activities the proponent shall implement the approved Vegetation Compensation Package required by condition 9-1 to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection and Department of Conservation and Land Management.

10 Environmental Management System

10-1 In order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to ground-disturbing activity, the proponent shall demonstrate to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection that there is in place an environmental management system which includes the following elements:

1 An environmental policy and corporate commitment to it;

2 Mechanisms and processes to ensure:

(1) planning to meet environmental requirements;

(2) implementation and operation of actions to meet environmental requirements;

(3) measurement and evaluation of environmental performance; and

3 Review and improvement of environmental outcomes.

10-2 The proponent shall implement the environmental management system referred to in condition 10-1.

Schedule 1

The Proposal (786)

The Peel Deviation project involves the construction of 52.1 kilometres of dual carriageway freeway standard highway from the future Freeway link north of Mandurah to the existing Perth-Bunbury Highway (Old Coast Road) at Lake Clifton. The deviation will provide a high standard inter-regional road link between Perth and the south west, bypassing Mandurah on the eastern side of the Peel Harvey Estuary. The highway will comprise two 11 metres carriageways with a median width of 15-40 metres.

Table 1: Summary of key proposal characteristics

Element	Description
Location	On the eastern side of the Peel-Harvey Estuary bypassing Mandurah. Extending from the southern most portion of the proposed Kwinana Freeway at Stock Road, Lakelands (near Mandurah) south to the intersection with Old Coast Road approximately 2.5 kilometres North of Johnston Road to the east of the southern most point of Lake Clifton.
Road Length	51.2 kilometres
Formation	Dual 11 metre carriageway freeway standard highway with a median width of between 15 and 40 metres.
Intersections	Intersections will be constructed at: Lakes Road; Pinjarra Road; Greenlands Road; Herron Point Road; Old Bunbury Road; Williamson Road; and Old Coast Road.
Bridges over waterways	Bridges will be constructed at: Serpentine River; Pinjarra Road; Murray River; South Yunderup Road; Murray River Floodplain; and Harvey River.
Bridges over Peel Deviation	Bridges will be constructed to carry Red Road, Paul Road and Mills Road over the Peel Deviation

Figure (attached)

Schedule 2

Proponent's Consolidated Environmental Management Commitments - Perth-Bunbury Highway, Peel Deviation (786)

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
1	Environmental Management Programme (EMP)	Prepare an EMP which includes: • dieback management plan • vegetation management plan • fauna management plan • rehabilitation and landscape plan • surface water management plan • construction management plan • foreshore management plan	To minimise and mitigate impacts on the environment	Pre-construction	DEP		EMP submitted for approval
2	Environmental Management Programme (EMP)	Implement the Environmental Management Programme	To minimise and mitigate impacts on the environment	Pre-construction, Construction, and Post construction	DEP	others as nominated for specific issues in the EMP	Compliance Reports
3a	Noise – Assessment, mitigation and monitoring	Monitor road noise during the first year of operation to demonstrate successful management and make the results publicly available	To manage the impacts of traffic noise	Post-construction	DEP		Compliance Reports
3b	Noise – Assessment, mitigation and monitoring	Provide advice on the need for noise mitigation measures for any subsequent proposed developments adjacent to the road that are referred for advice	To manage the impacts of traffic noise	Post-construction	DEP		Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
4	Surface Water Management Plan	Prepare and implement a Surface Water Management Plan to address issues including: • culvert and bridge design • incorporation of best practice drainage design at the time of construction • erosion control • specific design measures including retardation systems • containment of spills of hazardous goods due to traffic accidents	To minimise and mitigate impacts on the environment by: • maintaining the existing surface hydrology characteristics within the project area • Preventing deleterious impact on water (surface and ground) quality from the Peel Deviation project • minimising erosion due to the proposal • preventing direct discharge of surface water runoff from the project to the environment • preventing spillage of hazardous goods to the adjacent environment	Pre-construction	DEP	CALM, WRC, PIMA	Surface Water Plan submitted for approval.
5	Wetlands	Avoid the loss of conservation value wetlands (apart from at the Serpentine River crossing) and minimise impacts on all other wetlands	To prevent the loss of high conservation value wetlands and minimise impacts on other wetlands due to road construction and operation.	Pre-construction and Construction	DEP and WRC	DEP and WRC	Surface Water Management Plan Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
6	Vegetation Management Plan	Prepare and implement a Vegetation Management Plan to address issues including: • clearing of vegetation within the road reserve • a review of Declared rare and Priority flora Prior to ground disturbing activities	To minimise and mitigate impacts on the environment by: • minimising the area of vegetation cleared during construction to the minimum required for road construction and congruent with Austroads standards • ensuring impacts on Declared Rare and Priority Flora (as listed at the time of construction) are adequately identified and minimised during construction	Pre-construction and construction	DEP	CALM	Vegetation Management Plan submitted for approval. Compliance Reports
7	Vegetation	Clearing and re-use of cleared vegetation shall occur in accordance with the MRWA Environmental Management Manual and Roadside Floracare Manual (unpublished)	Minimise the clearing of remnant vegetation within the road reserve	Construction	DEP	CALM	Compliance Reports
8	Vegetation	Clearly identify and mark areas of vegetation to be cleared	To limit clearing of vegetation within the road reserve to the minimum required for road construction and congruent with Austroads standards	Construction	DEP		Compliance Reports
9	Dieback Management Plan	Prepare and implement a Dieback Management Plan	To prevent the spread of dieback due to road construction activities	Pre-construction and Construction	DEP	CALM	Dieback Management Plan submitted for approval. Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
10	Rehabilitation and Landscape Plan	Prepare and implement a Rehabilitation and Landscape Plan to address issues including: • weed management • revegetation strategies • visual amenity	To minimise and mitigate impacts on the environment by: • preventing the introduction and spread of weeds • using indigenous native vegetation species consistent with adjacent communities • ensuring visual amenity of the area adjacent to the project is not unduly affected by the proposal • revegetating previously cleared farmland within the road reserve	Pre-construction	DEP	CALM, PIMA	Rehabilitation and Landscape Plan submitted for approval. Compliance Reports-
11	Fauna Management Plan	Prepare and implement a Fauna Management Plan to address issues including: • a review of CALM's protected fauna lists Prior to ground disturbing activities • identify and implement appropriate fauna management techniques in areas of remnant vegetation • fauna migration pathways	To minimise and mitigate impacts on the environment by: • ensuring impacts on protected fauna (as listed at the time of construction) are adequately identified and minimised during construction • minimising disturbance to terrestrial fauna • providing fauna migration pathways at Nambeelup Brook and State Forest areas	Pre-construction, construction and post construction	DEP	CALM	Fauna Management Plan submitted for approval. Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
12	Foreshore Management Plan	Prepare and implement Foreshore Management Plan to address the issues of clearing, erosion control and scour at Serpentine, Murray and Harvey River crossings	To minimise and mitigate impacts on the environment at river crossings	Pre-construction and construction	DEP	WRC PIMA	Foreshore Management Plan submitted for approval Compliance Reports
13	Construction Management Plan	Prepare and implement a Construction Management Plan to address issues including: • dust • noise • vibration	To minimise and mitigate impacts on the environment by: • ensuring dust generated by the proposal does not create adverse social impacts • ensuring that noise complies with the *Environmental Protection (Noise) Regulations1997* • ensuring that vibration complies with industry best practise	Pre-construction and Construction	DEP		Construction Plan submitted for approval. Compliance Reports

Abbreviations

DEP – Department of Environmental Protection
CALM – Department of Conservation and Land Management
WRC – Water and Rivers Commission
PIMA – Peel Inlet Management Authority
MRWA – Main Roads Western Australia

Appendix 4

Summary of Submissions and Proponent's Response to Submissions

MAIN ROADS
Western Australia

PEEL DEVIATION

Perth to Bunbury Highway –
South of Metropolitan Region Scheme Boundary
to Peppermint Grove Road, Lake Clifton

Assessment 786

MRWA SUBMISSION TO THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENVIRONMENTAL PROTECTION AUTHORITY

JULY 2000

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Appendices

1. Review of Northern and Southern Alignment Options
2. Surface Water Management Plan
3. Proponents Revised Commitments

1.0 THE PEEL DEVIATION PROJECT

1.1 SUMMARY OF THE PEEL DEVIATION PROJECT

The Peel Deviation project proposed by Main Roads Western Australia involves the construction of 52.1km of dual carriageway freeway standard highway from the future Freeway link north of Mandurah to the existing Perth-Bunbury Highway (Old Coast Road) at Lake Clifton. The deviation will provide a high standard inter-regional road link between Perth and the south west bypassing Mandurah on the eastern side of the Peel Harvey Estuary.

The highway is likely to be built in stages depending on traffic volume predictions and available funding. Typical stages are single carriageway then dual carriageway with at grade intersections and finally freeway standard with grade separated interchanges. It is also possible that the project may be built in longitudinal stages such as the Pinjarra Road to Old Coast Road section and the Kwinana Freeway to Pinjarra Road sections being built separately to form the ultimate project. The highway will comprise of two 11m carriageways with a median width of 15-40m. Intersections and ultimately interchanges will be constructed at:

Lakes Road,
Pinjarra Road,
Greenlands Road,
Herron Point Road,
Old Bunbury Road,
Williamson Road, and
Old Coast Road

Bridges will be constructed to carry the Peel deviation over,
Serpentine River,
Pinjarra Road,
Murray River,
South Yunderup Road
Murray River Floodplain, and
Harvey River.

Bridges will also be constructed to carry Red Road, Paull Road and Mills Road over the Peel Deviation.

1.2 BACKGROUND

Main Roads recognised the need for a future freeway link to Bunbury in the mid 1980's which resulted in an alignment being defined in 1986 by Main Road's Strategic Planning section. The northern section from the Kwinana Freeway to Pinjarra road was developed in sufficient detail to be included in the Shire of Murray's Town Planning Scheme. Subdivisional activity has subsequently occurred along sections of this alignment in accordance with the scheme.

The preliminary route for the southern section, from Pinjarra road to Old Coast road was not discussed with government and local authorities, land owners or the general public. However the alignment was depicted on the Department of Planning and Urban Development's 1994 land Use Plan of the Peel Regional Strategy.

In order to further define the route and determine the environmental acceptability of the 1986 alignment Main Roads referred the Peel Deviation to the Environmental Protection Authority under Section 38 of the Environmental Protection Act (1986) in September 1992. The Environmental Protection Authority determined that the proposal be formally assessed at the level of Public Environmental Review in February 1993 and in May of that year the final guidelines for the preparation of environmental documentation were provided to Main Roads.

1.3 THE PER STUDY

Main Roads engaged GB Hill consulting engineers to develop a final road alignment and carry out the PER assessment for the Peel Deviation in July 1995. G B Hill subsequently engaged *ecologia* Environmental Consultants to carry out the environmental component of the assessment and prepare the PER document.

The first stage of the PER study was to determine an alignment for the highway route based on Main Roads 1986 alignment. A number of alignment options were considered and assessed in terms of their environmental, social, engineering and economic impacts. The Road Alignment Definition process involved Main Roads in the following consultation activities:

- convening a Consultative Liaison Group (August 1995) comprising State and Local Government agencies and representatives of community groups, such as the Farmers Federation and the Peel Preservation Group, with the aim of facilitating information transfer,
- contacting all possibly affect landowners to aid in the identification of opportunities and constraints,
- distribution of information brochure with reply paid response pro-forma to all possibly affected landowners, other relevant individuals and community groups,
- exhibiting possible alignment options at manned and unmanned displays at Pinjarra, Waroona and Mandurah.

This initial consultation phase prompted some 15 verbal and 64 written submissions which are detailed at Table 4 of the PER. The information gathered and public input was used in the Road Alignment Definition process to develop the preferred road alignment on which the PER document was based. The RAD process saw significant improvements to the alignment developed by Main Roads in 1986 particularly in the northern and southern sections of the route.

The consultation phase conducted during development of the PER commenced in December 1995 and involved the following activities:

- on-going meetings of the CLG
- general distribution of an information brochure (with reply paid responses)

- specific discussions and correspondence with landowners directly affected by the proposed alignment, and on-site meetings as requested
- public information displays at Mandurah, Pinjarra and Waroona libraries
- written responses to all submissions where requested.

During the development of the PER the alignment at the southern section was further amended in consultation with DEP and CALM to reduce the impact on Tuart woodland by utilising privately owned land on which a limestone quarry currently exists, and to better balance environmental impacts between Tuart Peppermint woodland and pine plantation.

The PER document was finalised on the revised alignment and released for public comment on January 11, 1997. The eight week PER consultation period was extended by four weeks at Main Roads request to April 4. A summary of the community responses to the PER received by DEP was then forwarded to Main Roads in late April 1997. Main Roads response to the issues detailed in the PER responses is detailed in this report, while below is a summary of Main Roads actions during the intervening period.

1.4 REVIEW OF NORTHERN ALIGNMENT

In March 1997 the Minister for Transport met with landowners affected by the Lakes Road to South Yunderup Road section of the Peel Deviation. In response to this meeting a review of additional alignment options was carried out by officers from the Minister's office external to the PER process. This review considered an alignment that avoided severance impacts on broad acre farmland north of Pinjarra Road. It should be recognised that in the PER study Main Roads considered environmental, social, economic and engineering issues while the Minister's review focused on social issues.

Details of this review are included in greater detail at Appendix 1.

In March 1998 the Minister for Transport announced that the alignment detailed in the PER would not be altered and that it remain the route for all future planning, and completion of the environmental assessment process.

1.5 REVIEW OF SOUTHERN ALIGNMENT

After lobbying from affected landowners in July 1998 the Minister for Transport requested Main Roads to review the alignment of the southern section of the route that impacted on private property on Old Coast Road.

After consultation with CALM and a review of the environmental impact of route options based on the southern alignment section detailed in the PER Main Roads recommended to the Minister that the PER route be retained. A summary of this review is detailed at Appendix 1.

In January 2000 the Minister for Transport endorsed Main Roads recommendation that the PER preferred alignment for the southern section of the road be retained. Finalisation of this review has

now provided for the completion of Main Roads responses to the PER public submissions and finalisation of the formal environmental approval process.

1.6 OLD COAST ROAD DUAL CARRIAGEWAY PROJECT

Delays in completing the formal environmental approval of the Peel Deviation as a consequence of reviewing the northern and southern sections of the project led to Main Roads timing for completion of the dual carriageway component of the Peel Deviation project becoming in doubt.

After consultation with DEP and CALM a formal request was made to exclude the dual carriageway component of the original Peel Deviation from the on-going PER. Consequently construction of the dual carriageway on the eastern side of the existing Old Coast Road (between Bagieau Road to 400m south of Peppermint Grove Road) was excluded from the PER and referred as a separate proposal to the EPA in August 1999. In consideration of this separate proposal and its likely environmental impact the EPA determined that the project be assessed at the level of Informal Review with Public Advice.

Main Roads has progressed developing the 5.75 km section of dual carriageway in consultation with CALM and DEP. Construction of this project is now currently underway. As a component of this project Main Roads carried out a land swap with CALM which resulted in a net increase of 2.1 ha of Tuart/Peppermint woodland being added to the Yalgorup National Park from surplus land within the Old Coast Road reserve.

1.7 Proponents Commitments

The Proponents Commitments detailed at Appendix 3 of this report do not exactly reflect those detailed in the Peel Deviation Public Environmental Review. The Commitments have been rewritten in consultation with DEP officers to reflect the current DEP format.

The Proponents Revised Commitments are congruent with the intent of the commitments detailed in the PER and assist the DEP audit procedures by clearly identifying actions and approvals required by Main Roads in obtaining environmental approval for the construction and operation of the Peel Deviation.

2.0 RESPONSE TO PUBLIC SUBMISSIONS

2.1 Biophysical

Note: where comments from several submissions have been amalgamated, a * is used to identify that comments have come from other submissions.

2.1.1 Flora and fauna

1. Insufficient detail has been provided on the flora & fauna surveys to review the adequacy of the work done (although one submitter then notes detailed reports may be available). * Flora and fauna surveys should be carried out on a seasonal basis - a one week survey in November 1995 is not

adequate and November is the wrong time of year. * Under-representation of orchids, trigger plants, & drosera highlight inadequacy of the survey * The inadequacy of the survey is demonstrated by only 14% of native mammals, 42% of bird and 46% of reptile taxa likely to be encountered being encountered * Survey ignored movement of fauna across the Pinjarra Plain. * Creditable flora and fauna surveys should be carried out to assess previous impacts and provide a baseline for future planning and management.

Response

Main Roads has committed (Proponents Commitment 6) that a review of the vegetation mapping and species list shall occur prior to construction at river crossings and System 6 Area C56. Action and management measures will be dependent on the Declared Rare and Priority Flora List current at the time of construction and is likely to require additional rare flora surveys to complement those previously completed. This commitment will be implemented to the satisfaction of the DEP and CALM.

Main Roads believes that the flora and vegetation survey for the project was adequate and that its timing during spring provided for the identification of all flowering plant species.. The flora and vegetation survey carried out for the project comprised of the following actions:

- a review of flora surveys carried out in similar and nearby habitats,
- a search of CALM's rare and priority flora database for the region to identify likely species found within the project area, and
- a ground survey conducted over the period 13-19 of November 1995 identified the flora from thirty quadrats of approximately 10x10m selected using aerial photographs and field observations to ensure that all vegetation types were represented. A further 30x30m area surrounding each quadrat, judged to be within the same vegetation type was scanned for any additional species.

It is accepted that some cryptic plant species may not have been observable at the time of the survey.

Similarly, Main Roads considers that the fauna assessment is adequate to highlight relevant impacts on fauna populations within the project area. The fauna assessment included:

- a six day fauna trapping programme at five trapping quadrants chosen as being representative of major habitat landforms. This programme included the use of pit traps, Elliott box traps, Tomohawk traps and detailed habitat searches for cryptic species,
- the recording of secondary evidence such as tracks, scats, diggings, nests and feathers where it was possible to identify the species responsible,
- recording of opportunistic species sightings in the project area while travelling and during trap establishment,
- a systematic survey of all habitats for bird species as each survey site was systematically traversed on foot for a number of 60 minute census periods, and
- a review of WA Museum, CALM data and other published and unpublished literature concerning fauna within the project area.

Proponents Commitment 11 provides for a review of CALM Scheduled Fauna List prior to the start of construction to ensure that all protected fauna at that time are considered for specific management measures. This re-assessment will be implemented to the satisfaction of the DEP and CALM.

2.1.2 Terrestrial vegetation – vegetation

1 There is no indication of the total area of vegetation to be cleared (See also comments under Wetlands - Estuary - Peel Harvey).

Response

The area of clearing for the Peel Deviation is summarised in Table 7 of the PER document. Minor amendments to the alignment through the PER process have subsequently resulted in changes to the areas detailed in the PER and as such a revised Table is detailed below.

For the purposes of the impact assessment process, the worst case scenario of clearing the whole 80-100m road reserve is considered for each major vegetation type in the project area - the total area impacted on this basis is 516.2 hectares. It is unlikely that clearing of the entire road reserve will be required and the Table details the respective clearing areas for each vegetation type based on a more realistic 60m clearing area. As noted at Proponents Commitment 4 clearing will be kept to the minimum necessary for the construction and safe operation of the highway.

Table 1: Amended Areas of Vegetation Impacted by Peel Deviation

Vegetation Association	Km Affected	Total Clearing area (ha) assuming 100-80m clearing width	Total Clearing area (ha) assuming 60m clearing width	% of Total Clearing Area
Cleared land/parkland cleared	37.55	375.5	225.3	72.43
Pine plantation	3.7	37	22.2	7.14
Corymbia calophylla over *Xanthorrhoea preisii* over mixed heath (C3c)	0.95	9.5	5.7	1.83
Kunzea ericifolia/Jacksonia furcellata heath (C5)	1.06	10.6	6.36	2.04
Samphire (C7)	0.10	1.0	0.6	0.19
Casuarina obesa/Melaleuca cuticularis over *M. viminea (C7)*	0.12	1.2	0.72	0.23
Myrtaceous heath (C9)	0.12	1.2	0.72	0.23
Eucalyptus rudis/Melaleuca rhaphiophylla woodland (C11)	0.82	8.2	4.92	1.58
Eucalyptus rudis/M. teretifolia heath (C12)	0.40	4.0	2.4	0.77
Melaleuca pauciflora heath (C14)	0.15	1.5	0.9	0.29
Banksia attenuata/Eucalyptus	5.05	50.5	30.3	9.74

marginata woodland (C21a)				
Eucalyptus gomphocephala/Agonis flexuosa woodland (C25)	2.2	18.25*	13.0	3.52
Total	**52.1km**	**518.45 ha**	**313.12**	**-**

* Note: area calculated assumes a 50m wide clearing required for dual carriageway component of project where existing Old Coast Road occurs

2 There should be a moratorium on all clearing of native bushland given the decline to date of our flora and fauna.

Response

As detailed in Proponents Commitment 7 vegetation clearing shall be kept to the minimum necessary for the construction and the safe operation of the Peel Deviation.

Preliminary estimates indicate that where the road reserve traverses currently cleared and parkland cleared areas, a distance of 37.55km, in excess of some 150ha of land will be available for rehabilitation as a component of the project. Proponents Commitment 10 will ensure the rehabilitation of the road reserve occurs as a component of the overall project.

The rehabilitation of 150ha of land within the road reserve exceeds the total clearing required for the road when the clearing impact on cleared/parkland cleared vegetation and pine plantation is excluded from the overall clearing area. The clearing areas detailed in the Table 1 at the Response to 2.1 detail the likely clearing areas, assuming 60m of the reserve is cleared, for roadworks through the various vegetation types.

As can be seen from Table 1 and Table 2 below the total project remnant vegetation clearing requirement is some 65.22 ha. Rehabilitation of 150 ha of road reserve will result in an overall increase in vegetation within the Peel Deviation road reserve of some 85 ha.

The above scenarios are summarised in the Table 2 below

Table 2 Peel Deviation Clearing and Rehabilitation Areas

Issue	Area (ha)
Area of road reserve for rehabilitation	150
Clearing area assuming entire reserve is cleared	518
Clearing area assuming entire reserve is cleared excluding clearing of cleared/parkland cleared vegetation and pine plantation	105

Clearing area assuming 60m entire reserve is cleared excluding clearing of cleared/parkland cleared vegetation and pine plantation	65
Likely increase in road reserve vegetation after clearing and rehabilitation assuming 40m strip of revegetation within road reserve.	85

3 "Cleared agricultural land" should be differentiated on basis of density of deep rooted perennial species, so an assessment of clearing these areas can be made in the context of the Statement of Planning Policy No 2 1992 The Peel-Harvey Coastal Plain Catchment so that there is a net gain in vegetation. * Vegetation should be differentiated by occurrence in vegetated basins or flat wetlands.

Response
As noted at Responses to 2.1 and 2.2 above clearing for the construction of the Peel Deviation will be minimised (Proponents Commitment 6), while rehabilitation of the road reserve (Proponents Commitment 10) will result in an additional area of some 65 ha of vegetation within the road reserve through the Peel-Harvey catchment. It is expected that some 150ha of rehabilitation will occur on the land that is currently cleared or parkland cleared palusplain. This outcome is congruent with the intent of Statement of Planning Policy No 2 1992 The Peel-Harvey Coastal Plain Catchment.

The vegetation mapping for the assessment process was carried out based upon standard methodology for determination of spatial differences according to species and strata occurrence. Assessment of the conservation value of vegetation is assessed through Rare or Priority species occurrence and level of representation of associations in established conservation reserves. Assessment of conservation values of wetlands is achieved separately through declaration of EPP lakes and through conservation assessment carried out by the Water & Rivers Commission. Integration of vegetation by wetland type is not likely to alter the outcome of the assessment in this case.

4 Clearing McLarty MPA is unacceptable being contrary to State Government policy on remnant vegetation and integrated catchment management.

Response
Refer to Responses 2.1, 2.2 and 2.3 above.

The significance of the McLarty MPA given the extent of historical clearing in the region is acknowledged by its inclusion within the System 6 Conservation Reserves. It should be recognised that the System 6 Red Book (DCE, 1983) recognises the potential for impacts from the Perth-Bunbury Highway on the McLarty MPA which is also recognised in the Yalgorup National Park Management Plan (CALM, 1994).

5 The route would destroy a 5.6 km strip of Tuart/Peppermint woodland of the McLarty MPA. This vegetation is only reserve in this area and Yalgorup National Park and so its loss is

unacceptable. * Environment Australia strongly recommends this alignment be reconsidered, with impacts on Lake Clifton also being considered.

Response

During the time that the PER study has been in progress the original scope of the dual carriageway component of the Peel Deviation has been reduced. A 5.75 km section of dual carriageway (from 300m south of Peppermint Grove Road to Bagieau Road) has been excluded from the bounds of the PER and has been assessed as a separate project by the EPA under Section 38 of the WA Environmental Protection Act. As a component of this separate project Main Roads enacted a land swap with CALM which resulted in a net increase of 2.1 ha of Tuart/Peppermint woodland being added to the Yalgorup National Park from surplus land within the Old Coast Road reserve.

In addition Main Roads has endeavoured to minimise the impact of the Peel Deviation on the Tuart/Peppermint woodland through adjustments to the road alignment. Throughout the development of the Peel Deviation a number of road alignments have been considered – the original MRWA 1980s alignment, the Road Alignment Definition preferred alignment and the PER preferred alignment. The impacts on the Tuart /Peppermint woodland of these alignments is summarised below:

Table 3 Impacts of Alignment Options on Proposed Yalgorup National Park Additions

Road Alignment Option	Impact on Tuart/Peppermint Woodland proposed for inclusion into Yalgorup National Park
Original MRWA 1980s Peel deviation alignment	Traversed 3.4 km of Tuart/Peppermint woodland proposed for inclusion into Yalgorup NP Impacted on western margin of Tuart/Peppermint woodland proposed for inclusion into Yalgorup NP for a distance of some 4.8km
Road Alignment Definition Report Alignment	Traversed 4.3km of Tuart/Peppermint woodland proposed for inclusion into Yalgorup NP Impacted on western margin of Tuart/Peppermint woodland proposed for inclusion into Yalgorup NP for a distance of some 3.0km
PER Preferred Alignment	Traverses 2.2 km of Tuart/Peppermint woodland proposed for inclusion into Yalgorup NP Impacts on western margin of Tuart/Peppermint woodland proposed for inclusion into Yalgorup NP for a distance of some 4km

It can be seen from this comparison that the refinements to the road alignment have resulted in reduced impact on the Tuart Peppermint woodland vegetation.

Currently Old Coast Road is the major inter-regional route between Perth and south west of Western Australia and will remain so until the Peel Deviation is constructed. Old Coast Road parallels Lake Clifton over a distance of some 16km and aligns 400-600m to the east of the lake. Construction of the Peel Deviation will result in the major through traffic route passing within 400-600 m of Lake Clifton over a significantly lesser distance of 500m at its southern end. It has been recognised that the northern half of the eastern shoreline may have the greatest inflow of water to the lake (CALM, 1994) and as such the Peel Deviation will direct through traffic away from this area.

The distance between the Peel Deviation and Lake Clifton also complies with the set back requirements specified for horticultural developments within the Lake Clifton catchment (EPA, 1995).

Lake Clifton is fed by freshwater directly or indirectly as overflow from an adjacent wetland to the east. It is suspected that an impermeable barrier just to the east of the lake prevents fresh groundwater entering the lake directly (EPA, ibid). Main Roads considers that the proposed road will have a negligible effect on the surface recharge of the Lake. Should an accidental chemical spill occur on the section of Peel Deviation adjacent to Lake Clifton the nature of the lakes recharge by overland flow and the separation between the two provides for emergency cleanup action to be initiated prior to any discharge into the lake.

6 Community Type 25 is officially listed as susceptible, and contains Priority 2 flora. Therefore it should not be cleared.

Response
The submitter is correct in that the "Floristic Survey of the Southern Swan Coastal Plain" (Gibson et al, 1994) identified Community Type 25 as being susceptible. The status of this vegetation type and its regional significance is further recognised in the PER and Main Roads is fully aware of its conservation value.

The susceptible categorisation of vegetation type 25 needs to be considered in the context of the classifications by Gibson et al who identified seven criteria of Conservation Status – presumed destroyed, critical, endangered, vulnerable, susceptible, low risk and insufficiently known. It can be seen that the 'susceptible' criteria is at the lower end of the conservation status ranking.

The *Lasiopetalum membranaceum* population identified during the biological survey for the project was outside of the area of impact expected by the road. The Priority 2 population was identified west of the current Old Coast Road whereas the new carriageway is planned for construction east of the existing road.

7 Type 25 vegetation will become, or is already regionally significant because of clearing for urbanisation. (Page 48 of PER says it may be regionally significant).

Response
As noted at the response to 2.6 above Main Roads recognises the conservation value of the Tuart Peppermint woodland and it is identified in the PER as being regionally significant. This statement

was made in recognition of the System 6 recommendations for the McLarty and Clifton MPAs to be included within the Yalgorup National Park.

8 With the loss of tuart trees and remnant vegetation along the route, it is suggested that the proponent consider a program of bushland replacement, similar to the Wetland Replacement Policy for the Kwinana Freeway.

Response
The submitter referred to the responses 2.1 and 2.2 that address clearing and rehabilitation areas and relevant Proponents Commitments 7, 8 and 10.

9 There is no commitment to seeding or planting of cleared roadsides (relying only on topsoil seed stores) or monitoring/management of rehabilitation success.

Response
Proponents Commitment 10 addresses the need to prepare a Landscape and Rehabilitation Plan for the project prior to construction. This plan will address the issues of seeding, planting and monitoring and will be prepared to satisfy the requirements of the DEP. The specific details of rehabilitation methodology is deferred until closer to the time of construction, to ensure that suitable rehabilitation techniques and standards prevalent at that time are incorporated into the project.

10There are 16 vegetation associations in the Biological Survey report, but only 13 in the PER, 12 of which do not match those in the Biological Survey. Such inaccuracies do not help!

Response
The Biological Survey report was carried out for all of the options considered in the initial phase of the road alignment definition process, while the PER documents the vegetation associations on the preferred alignment only. Not all the vegetation associations described for the Biological Survey occur on the preferred alignment, resulting in the difference in the number of associations between the two documents. With this in mind there is no difference between the 13 vegetation associations in the PER and those described in the Biological Survey.

11CALM's response in objecting more strongly to severance of the pine plantation than high conservation bushland is disappointing.

Response
The Proponent is not able to comment on the policy, operations and response of CALM in reference to this project.

12Compensation to CALM/NPNCA should be provided for nature conservation values as is done for plantation values.

Response
Main Roads acquires land under the provisions of the Public Works Act 1902. This Act and current government policy does not provide for the payment of compensation for the loss of conservation values on land such as State forest between government agencies.

13Limestone resources should not be obtained from the proposed extension to Yalgorup National Park but areas with low conservation value should be utilised. The proponent would be advised to secure sources now.

Response
It was not Main Roads intention, nor was it indicated in the PER, that road construction materials be sourced from the proposed extension to the Yalgorup National Park. It is likely that some in-situ materials currently within the road reserve may be used as road building material but the vast majority will be sourced from commercial suppliers whose operations occur beyond the proposed extension to the Yalgorup National Park.

14Given the past history of impacts in the Peel Region on bushland and wetlands which has reduced the quality of environment for the present generation compared with the previous, existing remnants should all be protected and it should be recognised that they are all under stress. It is not acceptable to continually take a small portion of remnants because this leads to long-term loss. Ignorance is no longer an excuse.

Response
The impact of development on the natural environment is well documented and the conservation intent of the comment is noted. In general, the vegetation associations impacted by the project are well represented within nearby System 6 areas, Yalgorup National Park and Kooljerrenup Nature Reserve.

As detailed at 2.2 above the Peel Deviation is likely to result in an overall increase in vegetation coverage along the length of the Peel Deviation road reserve of over 84 ha.

2.1.3. Terrestrial vegetation – disease

1 The route through McLarty MPA (S6 C56) is unacceptable because the area is currently dieback free and sourcing dieback free materials in this area may be difficult.

Response
The McLarty MPA essentially occurs over limestone and limestone derived soils which are recognised as not susceptible to *Phytophthora cinnamomi* (dieback) fungus (Dieback Consultative Council, 2000). To ensure adequate management of dieback Proponents Commitment 9 states that a Dieback Management Programme for the project will be prepared and implemented congruent with the requirements of CALM prior to roadworks commencing.

As noted at 2.13 above it is not Main Roads intention to source road construction materials from the proposed extension to Yalgorup National Park.

2 The high water table/moisture levels in the soil make the risk of transmission of dieback high and the flora highly susceptible to dieback. There is evidence adjacent to Goodale Sanctuary of fungal spores being transmitted via road repair.

Response
Soil movement of any nature is recognised as having the potential to spread Phytophthora fungus. As noted at the Response to 3.1 above Proponents Commitment 9 provides for a Dieback Management Programme to be prepared and implemented congruent with the requirements of CALM prior to roadworks commencing.

2.1.4. Terrestrial vegetation - Declared Rare Flora

1 The rare Tuart Rufous Greenhood Orchid (*Pterostylis aff. picta*) has been found by the Orchid Society within the road reserve at the southern end of the road (Note the submitter who made this comment was not the Orchid Society).

Response
The Tuart Rufous Greenhood Orchid (now called *Pterostylls sp. yalgorup*) is discussed on Page 48 of the PER document. The species is listed on CALM's 1999 Declared Rare and Priority Flora List as a Priority 2 species. While the known populations of the orchid will not be impacted by proposed works it should also be recognised that no new populations of this orchid were identified during the Biological Survey of the proposed road alignment,.

Main Roads is fully aware of the Tuart Greenhood Orchid population east of the existing Old Coast Road and has fenced the population to ensure it remains secure.

2 The route through McLarty MPA (S6 C56) is unacceptable because * Priority 2 flora (*Lasiopetalum membranaceum*) are likely to be found in the Vegetation type 25 woodland; * Insufficient information is known about the Priority 2 flora to assess the impact on local populations at this stage * the vegetation will be affected by weeds.

Response
As noted at 2.6 above the *Lasiopetalum membranaceum* population identified during the biological survey is beyond the area of impact caused by the proposed road.

Due to the time period between the preparation of the PER and the anticipated construction time, Main Roads WA has committed to reviewing the vegetation mapping according to the Declared Rare and Priority Flora List current at construction (Proponents Commitment 6). Specific management strategies will be determined in association with CALM should species not currently having rare status be reclassified as such.

Introduction of weeds is an acknowledged potential impact of the project. As such weed management strategies will be implemented as a component of road construction activities and through the on-going management of the road reserve (Proponents Commitment10). These strategies are aimed at reducing the potential to introduce additional and/or new weed species into areas of remnant vegetation or conservation reserves.

2.1.5. Terrestrial fauna - fauna

1 The fauna survey should have covered a larger area and included consideration of waterbirds (including migratory).

Response
The Biological Assessment conducted as a component of the Peel Deviation PER covered a strip up to 5km wide through the general project area and included all of the potential route options identified in the project Road Alignment Definition Report. The extent of the Biological Assessment, and review of the relevant published and unpublished literature database on the area is considered to adequately identify fauna impacts of the project. The survey specifically considered migratory waterbirds at Section 5.5 of the PER.

2 No reference to Phascogales which reside in bush east of Old Coast Road. Phascogales have been seen both dead & alive in this area.

Response
The potential for Phascogale (*Phascogale tapoatafa*) populations to be found in the project area was an omission from the report. The WA Museum has a record of a specimen from the Lake Clifton area but the species is not known to occur in the Yalgorup National Park (CALM, undated). While uncommon in the south west of WA and confined to forest areas, the species has no formal protection or conservation status in Western Australia. The species status is described as widespread, populations localised, uncommon to rare (Strahan, 1995).

Although no Brush-tailed Phascogales were recorded during the Biological Survey the construction of the Peel Deviation has the potential to impact on any unrecorded populations through the loss of habitat, habitat fragmentation and roadkills. Proponents Commitments 6, 7, 8 and 11 are aimed at managing these impacts in consultation with the DEP and CALM at the time of construction.

3 The consultants comments about their under sampled bat fauna show little understanding of the biology of bats. Preliminary surveys at Goodale Sanctuary 2 km from the site show bats may be a relatively intact and ecologically important component of the mammal fauna surrounding the alignment.

Response
It is agreed that the bat fauna may be the most complete component of the project mammal fauna. The PER stated that at least eight bat species would be present in the project area. Aside from localised loss of bat habitat to some species which roost in tree hollows through vegetation clearing the Peel Deviation presents no significant impact to bat populations of the region due to the presence of suitable habitat in the wider project area. Proponents Commitment 7 to minimise clearing will ensure minimal impact on local bat populations.

4 The PER incorrectly assumes that migratory birds will only use wetlands. Rainbow Bee-eaters don't!

Response
It is accepted that the Rainbow Bee-eater (*Merops ornatus*) which is a migrant aerial feeder is not limited to wetlands. This is a wide ranging species which forages over all habitats in the project area. Main Roads believes that the project will present no significant impact to this species due to the minimal local impact on suitable Bee-eater habitat and the presence of suitable habitat within the wider project area.

5 Palusplain are important for waterbird breeding and these are de-valued by the proposal.

Response
The PER recognises the value of the palusplain however the project poses minimal impact on this widely distributed regional feature. Less than 230ha of palusplain over a distance of some 37.6km will be impacted by the road within a greater palusplain which extends from Byford to west of Busselton.

As detailed at the response to 2.2 above the Peel Deviation provides the opportunity to remove from private ownership and rehabilitate in excess of 150ha of palusplain which is currently cleared/parkland cleared.

6 The PER has not addressed the impacts of lighting, overhead wires and other hazards to waterbirds in an area which is palusplain and near other important wetlands.

Response
Main Roads is not proposing to install overhead wires along the proposed route.

Individual interchanges and intersections will be lit to improve night time traffic safety, however underground power will be used at these locations. Road lighting is designed to comply with Australian Standard AS 1158 with the objective of providing a lighted environment which is conducive to the safe and comfortable movement of vehicular and pedestrian traffic at night. Some light spill can be expected at lit intersections but this is kept to the minimum possible while fulfilling the objectives of the lighting standard. Overall the impact of planned lighting at seven intersections over the 52 km length of the road is unlikely to result in major disturbance to water birds.

Main Roads has no control over the use of the road reserve by other service authorities who can, within the limits of their respective legal powers, use any publicly or privately owned land for the installation of their services.

7 The route through McLarty MPA (S6 C56) is unacceptable because * it will fragment the area into three restricting fauna movement; * small fauna islands will be created making the habitat un-viable for some species; * migration pathways are not effective

Response
The development of the alignment through the McLarty MPA is discussed at Response 2.5 and 2.6 above. It is acknowledged that the preferred route through the McLarty MPA will cause fragmentation of the habitat for terrestrial fauna, although the size of the habitats are contiguous

with remnant native vegetation and pine plantations providing access to alternative habitats for fauna species. In recognition of these potential impacts Main Roads has proposed Proponents Commitments 7, 8, and 11 with the objectives of minimising the loss of habitat, and minimising the fragmentation impacts by providing fauna movement pathways between divided habitats.

Main Roads have been constructing and monitoring fauna underpasses on a number of its road since the early 1990's. Monitoring of existing underpasses indicates that small to medium sized fauna, including Southern Brown Bandicoots *Isoodon obesulus*, make use of these facilities. The Busselton Bypass, which is currently under construction, includes underpasses designed specifically to provide for the movement of small and larger fauna, including kangaroos to access habitats severed by the new highway. The use of these larger facilities on the Busselton Bypass will be monitored once road construction is completed to determine the effectiveness of such structures for potential future use on the Peel Deviation.

8 Fauna (including kangaroo) migration pathways should be required between Patterson Rd & Pinjarra Rd.

Response
Proponents Commitments 11 has been made to provide for the management of fauna impacts from the road to the satisfaction of CALM. The requirement for specific fauna management and there location will be determined during the detailed project design phase of the Peel Deviation.

9 The bandicoot underpass proposal is a patently ridiculous throwaway notion.

Response
As noted at Response 5.7 Main Roads have been constructing and monitoring fauna underpasses on a number of its road since the early 1990's. Monitoring of existing underpasses indicates that small to medium sized fauna, including Southern Brown Bandicoots *Isoodon obesulus*, make use of these facilities. The installation of fauna underpasses is an important management tool used to reduce the impact of roads on fauna movements.

10The Commonwealth Endangered Species Protection Act 1992 database indicates *Myremcobis fasciatus, Drakea elastica* and *Dasyurus geoffroii* may occur in the vicinity of the proposed Peel Deviation. Further attention may be necessary to protect them. The Threatened Species and Communities Section - Biodiversity Group of Environment Australian should be advised of the location of the species and proposed actions toward their conservation.

Response
The Glossy Leafed Hammer Orchid (*Drakea elastica*) is a DRF species found in Banksia Woodland adjoining winter wet swamps. No habitats of this type will be impacted by the Peel Deviation project. This species flowers during October and November and was not recorded during the Biological Survey of the proposed alignment conducted in November 1995. As no suitable orchid habitat is impacted by the alignment and no populations of this orchid were recorded during the Biological Survey carried out during its flowering period it is unlikely that these plants occur within the proposed road reserve.

No sightings have been recorded for the Numbat (*Myrmecobius fasciatas*) on the Swan Coastal Plain since 1985 (Tony Friend, pers comm). The only record for this species on the Swan Coastal Plain is in the vicinity of Jandakot. It is considered that this species is extinct in the vicinity of the project area.

The Chuditch (*Dasyurus geoffroii*) has been recently captured by CALM within the Yalgorup National Park. No recent records are known from the vicinity of the Peel Deviation project area, nor have roadkills on Old Coast Road been recorded since the early 1980's. However the species may potentially exist in the area.

On finalisation of the Public Environmental Review Main Roads will liaise directly with Environment Australia in regards to the Peel Deviation project and compliance with the relevant requirements of the Commonwealth Government's environmental legislation.

2.1.6. Hydrology

1 The need to protect wetlands/ground water hydrology could be significant given that the area is seasonally waterlogged (interlinked with other wetlands) and that the road could require removal and replacement of 2 m of material (80 000 m3/km, up to 100 000 truck loads each way for total length of road - not including road-making material and estimating from Beecham Rd to Doman Rd) if geotechnical work (not yet done) finds similar soil foundations conditions to those on the Kwinana Freeway. Other construction techniques (eg. pre-loading, wick drains, the use of enzymes or soil modifying agents) to deal with poor soil foundations may also have adverse impacts. Many culverts would be needed to maintain surface water hydrology. This has not been addressed in the PER, and nor have the cost implications of this aspect (including the need to construct during summer only).

Response

The need to maintain existing drainage patterns and the quality of surface and ground water is acknowledged in the PER document pages 50, 51 and will be managed by the methods detailed in Proponents Commitments 4 and 5. Section 6.3.3 of the PER specifically refers to the need for culverts to manage surface water hydrology.

Main Roads has subsequently developed a Surface Water Management Plan for the palusplain section of the alignment which has been endorsed by the Water and Rivers Commission. This Surface Water Management Plan is detailed at Appendix 2 and proposes the use of culverts to maintain existing east-west overland surface water flows.

Sections of the route that are seasonally inundated are predominantly found on the Guildford formation soils which typically consists of sand, silt and clay layers with limited permeability. These soils are considered to be of adequate strength for the future road foundation and as such the existing ground would not be excavated prior to placing the embankment material for the road.

The height of the road embankment cannot be adequately defined at this stage of the project, although based on similar projects undertaken by Main Roads it is expected to be in the vicinity of 1.0-1.5m above the existing ground surface.

Economic issues associated with the number of culverts were not addressed in the PER as they do not have a direct environmental impact. The impact of limiting road construction activities to the drier spring and summer months is a typical scenario on most road construction projects in the SW of the state where there is a limited period for road construction activities between spring and autumn.

2 Concerned that ground water flow to Lake Clifton necessary to support the thrombolites may be affected by this proposal.

Response
Refer to Response 2.5 above.

3 The proponent should assess hydrological impacts at the local level as increased waterlogging can have significant impacts on farming and create bare areas suffering wind erosion and dust problems. * this could affect viability of some farming operations.

Response
In order to assess the hydrological impacts at the local level, detailed survey of the natural ground surface and identification of the existing drainage paths is required. This level of detail is currently not available, however it will form part of the detailed design phase of the works. It is recognised that some localised impacts to ground and surface water flow may result from the road formation but Commitments 4 and 5, and the Surface Water Management Plan at Appendix 2 provides for the overall maintenance of local surface hydrology by the use of culverts and appropriate bridge design.

Pre-construction assessment of existing surface water drainage will provide for a review of the post construction situation and identify any unforseen impacts. Where unforseen impacts as a consequence of the road are identified then additional works will be carried out to address the specific issue.

4 Given the location of the deviation on Palusplain, the road would be expected to disrupt local surface water and drainage patterns (ie. hydrology). This is not adequately addressed in the PER.

Response
The impact on local surface and groundwater movements of the proposal are detailed at sections 5.2.3 and 6.3.3 of the PER. Proponents Commitment 4 provides for maintenance of the local surface water hydrology through the project area while the Surface Water Management Plan endorsed by the Water and Rivers Commission is detailed at Appendix 2. Road drainage details will be designed in accordance with the Surface Water Management Plan which recognises the need to maintain existing transverse drainage paths by the provision of culverts to balance the water flow on either side of the road.

5 The road formation will remove 439 ha of annual pasture which uses water. The impacts of this on the area's hydrology has not been properly considered.

Response
The likely loss of cleared land by construction of the road is detailed in the table at Response 2.1 above and is likely to be in the vicinity of 225.3ha. Proponent's Commitment 10 provides for the replacement of annual pasture with 150ha of indigenous perennial vegetation within the road reserve. Deep rooted perennial vegetation is recognised as having a greater water usage than pasture species (Government of WA, 1998).

6 Road drainage would appear to be contrary to the moratorium on drainage which applies to agriculture.

Response
The moratorium on clearing and drainage within the Peel Harvey Coastal Plain Catchment does apply to the Peel Deviation project. This moratorium was set as a Ministerial Condition following the Stage 2 ERMP for the Peel Harvey Inlet to reduce phosphorus input into the inlet. Some flexibility has been permitted in the interpretation of these controls provided projects are designed to significantly reduce nutrient flows to the estuary.

As noted at Responses 6.1 and 6.5 above existing surface water drainage movements will be maintained through the design of the road. Revegetation of the currently cleared/parkland cleared section of the road reserve will increase the area of vegetation within the Peel-Harvey catchment by some 150ha, subsequently increasing the uptake of water from the catchment.

7 PER failed to examine impacts on ground water hydrology as required by the Guidelines.

Response
Section 6.3.3 of the PER document outlines possible impacts of the project on the groundwater hydrology as required by the EPA Guidelines.

The submitter is referred to Response 6.1 above.

2.1.7. Wetlands – general

1 Some of our last remaining wetlands remaining on the coastal plain will be destroyed or further endangered by this proposal. * With only 20% of our Coastal Plain wetlands remaining it is a disgrace to destroy any to build a new highway.

Response
The alignment of the Peel Deviation has been determined to avoid impact on all wetlands protected by the Environmental Protection (Swan Coastal Plan Lakes) Policy and to minimise impact on sumplands and damplands not protected by the EPP.

Two areas of floodplain identified by the Water and Rivers Commission (Hill et al, 1996) as having a Preliminary Wetland Management Category of Conservation will be impacted by the proposed Serpentine River crossing. The floodplain supports *Melaleuca pauciflora* heath, Samphire and *Casuarina obesa / Melaleuca cuticularis* over *M. Viminea* vegetation associations. Gibson et al (1994) has identified these vegetation types as detailed below:

Community Type	Reservation Status	Conservation Status
Melaleuca pauciflora heath (14)	Unreserved	Insufficiently Known
Samphire (7)	Well reserved	Vulnerable
Casuarina obesa / Melaleuca cuticularis over *M. viminea* (7)	Well reserved	Vulnerable

Impacting on the floodplain at this location is unavoidable without re-locating the bridge crossing. Re-location of the bridge crossing is not feasible due to residential sub-division in the vicinity of the road and river, the need for a major re-location of the river crossing and the re-alignment of sections of the Freeway north of this location.

The central section of the route traverses the seasonally inundated Pinjarra Plain however the loss of palusplain will be minimal considering the extensive nature of this natural feature that extends from Byford to west of Busselton.

The proposed replacement of 150ha of cleared palusplain that supports little more than pasture grasses at present by revegetation with native indigenous perennial vegetation is considered by Main Roads to be a significant improvement in wetland function over this section of the route. It is recognised that revegetation will not provide the ultimate ecological function of an undisturbed wetland habitat but the proposed rehabilitation will significantly improve the function currently provided by seasonally inundated pasture.

Considering that the Peel Deviation alignment avoids all EPP lakes and will result in an additional 150 ha of vegetation over the palusplain it could be considered that proposal will result in a significant increase in wetland habitat within the overall Peel-Harvey catchment.

2 This proposal is inconsistent with the EPA phrase no loss of wetlands.

Response
Refer to Response 7.1 above.

3 The loss of wetland from approving the road is inappropriate until the South West Wetlands EPP and CALM's State Wetlands Policy are complete.

Response
The Peel Deviation occurs within the area subject to the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 and is not within the bounds of the Environmental Protection (South West Agriculture Zone Wetlands) Policy 1999. The PER and Response 7.1 address the issue of wetlands protected under the Swan Coastal Plain Lakes EPP.

The fact that the Peel Deviation is being assessed by the EPA is congruent with the objectives of the Wetlands Conservation Policy for WA (Government of WA, 1997).

4 Avoidance of wetland impacts is preferable, but where wetlands are impacted PIMA and WRC recommend the approach outlined in the United States Department of Transportation manual "Highways & wetlands, compensating wetland losses" should be used to compensate for wetland losses.

Response
Main Roads accepts the objective of the US Department of Transport document referred to and this is reflected in the Proponents Commitments and details at Response 7.1.

5 Concerned that Main Roads has already reneged on wetland replacement in other projects, so cannot be trusted.

Response
Main Roads disagrees with this statement and will continue to work with other government agencies and the community to fulfil its objective of managing and developing the states road network in an environmentally sensitive manner.

6 The criteria established by the Western Australian Water Resources Council (WAWRC) (in the Perth-Bunbury Region Report 1987) should have been used by the PER to assess the significance of wetlands along the route (The submission representing five submitters detailed the criteria) * The road passes through the Mungala Wetland Suite identified as being of high to medium conservation value (WAWRC, 1987 Figure 5 pg 29).

Response
The WAWRC utilised a classification system which since 1987 has been developed and utilised by the EPA and the WRC in subsequent wetland assessment programmes, resulting in the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 and the 1996 Wetland Mapping, Classification and Evaluation programme respectively. These recent assessments were utilised preferentially as they represent the State Government position on conservation value wetlands.

7 Given the location of the deviation on Palusplain, EPP and other wetlands will be interlinked through surface and ground water flows with the road, and as such will impact on the catchment of important wetlands. This interlinking is not addressed in the PER.

Response
Sections 3.4 and 5.3 of the PER describe the hydrology and hydrogeology of the project environment noting the seasonally inundated nature of the Pinjarra Plain, the areas flat topography with negligible natural drainage and the extensive system of constructed drains linking agricultural land with natural drainage channels and wetlands.

The PER notes that the construction of the road will result in some localised hydrological impacts. Proposed measures to manage this impact are detailed at Response 7.1.

8 The road will form a levee across the Mungala wetlands directing all surface and ground water flow through aqueducts increasing speed of flow at these points increasing erosion, establishing more riverine systems and changing the ecosystem. It will also reduce nutrient loss in drainage and could affect important birdlife in the estuary. The PER should have addressed flow management.

Response
As detailed at Response 7.1 above existing surface hydrology will be maintained by the use of culverts and appropriate bridge design. As detailed at Proponent's Commitment 4 and 5 the issue of drainage management will be addressed in conjunction with other relevant government agencies during the pre-construction phase of the project.

The PER document addresses surface and groundwater flow on pages 50 and 59 while Commitments 12 and 17 will ensure that interruption of surface water flow will be mitigated and that erosion control measures will be incorporated in the design.

The linkage of existing water courses in the area (rivers, streams and construction drains), will be maintained with appropriate bridges and culverts without increasing the velocity of flows. This will ensure that the pattern of water flow will be unaltered and that there will be no change in nutrient transportation, erosion and other flow aspects likely to affect the ecosystem.

Outside of recognised watercourses, the water inundation of the Palusplain area is generally standing water and only minor but regular culverting is expected to be required to allow for any balancing flows across the road to maintain the natural hydraulic balance.

A Surface Water Management Plan for the project has been developed and included at Appendix 2. The concept design reflects the issues detailed above and provides the basis for the future road drainage design. The concept design was developed and has been subsequently approved by the Water and Rivers Commission.

9 It is inappropriate that the main transport artery for industrial chemicals, petroleum and other goods should go through a major wetland system. Rails would be safer.

Response
The Peel Deviation will be constructed to Austroads standards with a high level of inherent road safety and include the provision of pollution control devices at bridge, creek and drain crossings to intercept any accidental chemical spills. The Surface Water Management Plan at Appendix 2 provides for the management of off-road run-off as agreed by the Water and Rivers Commission.

The Southern Province Transport Strategy (1998) commissioned by the Government of Western Australia considered all future transport requirements for the southern province of WA including, road, rail, air and sea transport. This Strategy identified the Peel Deviation as a necessary future transport infrastructure requirement for the state.

10Protecting EPP wetlands is insufficient. Some of the most important habitats are closed vegetation wetlands which would not necessarily be protected by the proposed road alignment.

Response
The alignment of the Peel Deviation has been determined to avoid impacts on EPP Lakes in the project area, as required under the Policy, and to minimise impacts on all other wetlands. The route selection process attempted to minimise the impact of the road on wetlands and of the alignments considered the preferred alignment had the least potential impact of those considered. Due to the nature of the project environment it is not possible to avoid any impact on pastured wetlands or the extensive palusplain.

11Efforts should be made to avoid natural or semi natural basin wetlands and vegetated flat wetlands as described by the Water and Rivers Commission, in addition to avoiding EPP Wetlands.

Response
This issue is addressed at Response 7.10 above.

12Concerned that potential impacts on Lakes Mealup & McLarty not identified, especially as Lake Mealup is currently being rehabilitated.

Response
Lakes Mealup and McLarty are some 6 and 3.5km respectively from the Peel Deviation alignment. Based on buffer widths recommended in the report of Davies and Lane (1995) – Guidelines for the Design of Effective Buffers for Wetlands on the Swan Coastal Plain the Peel Deviation is unlikely to have any impact on Lakes Mealup and McLarty.

13Clause 13 (1) of the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 includes catchments and this has been ignored in the PER.

Response
Clause 13 (1) refers to the construction or alteration of drainage systems in lakes protected by the EPP and does not refer specifically to catchments. This proposal will not cause the construction or alteration of any system for the drainage of water into or out of any designated EPP wetland. Similarly, all wetlands along the proposed alignment identified as having a Preliminary Wetland Management Category of Conservation have been avoided except at the Serpentine River crossing.

Proponents Commitment 12 for the preparation and implementation of a Foreshore Management Plan in co-operation with the Peel Inlet Management Authority and Water and Rivers Commission will ensure that impacts at the Serpentine, Murray and Harvey River crossings are managed and minimised.

14The 1995 report to the Australian Nature Conservation Agency "Guidelines for design of effective buffers for wetlands on the Swan Coastal Plain" should be used to determine wetland buffers.

Response
Due to the number and proximity of basin type wetlands and the nature of the palusplain through which the central section of the Peel Deviation traverses complying with the recommendations of

the ANCA report is not possible. However no wetlands protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy1992 will be directly impacted by the proposal.

The Surface Water Management Plan endorsed by the Water and Rivers Commission and measures detailed at Proponents Commitments 4 and 5 will ensure that the impact on all wetlands and watercourses along the length of the alignment is minimised.

15It is essential that the WA Government determine whether or not the proposed route crosses the Ramsar area. The PER claims it does not, but this claim is not substantiated.

Response
Main Roads reiterates that the Peel Deviation does not impinge on the Ramsar listed wetland. Advice from CALM shows that the boundary of the Ramsar area closely replicates System 6 Red Book areas Peel Inlet (C50), Harvey estuary (C51), and Lakes McLarty and Mealup (C52) which are not impacted by the proposed road reserve.

16The State Government has not honoured its obligations under the Ramsar convention to consult the Commonwealth regarding this proposal.

Response
The Peel Deviation project does not impact on the Ramsar listed wetland and as such the Western Australian government's obligations under the Ramsar convention have been fulfilled.

17We believe International treaties will be breached if this road proceeds as proposed as it impinges on their catchments.

Response
Refer to response to 7.15 and 7.16 above.

2.1.8. Wetlands - watercourses

1 A foreshore management plan should be required for an appropriate areas to either side of any river crossing to the satisfaction of Peel Inlet Management Authority.

Response
Main Roads recognises the need to manage impacts on the foreshore of rivers at bridge crossings and as such has made an additional commitment (Proponents Commitment 12) to prepare a Foreshore Management Plan for bridge crossings in consultation with the Peel Inlet Management Authority to the satisfaction of the DEP.

2.1.9. Wetlands - Estuary - Peel-Harvey Estuary

1 The proponents should assess the hydrological impacts of clearing deep rooted perennial vegetation (including "Cleared agricultural land) associated with the proposal with a view to revegetating at least as much as is cleared. This requirement would be consistent with the Statement of Planning Policy No 2 1992 The Peel-Harvey Coastal Plain Catchment.

Response
The Peel-Harvey Coastal Plain Catchment Statement of Planning Policy No 2 includes a general policy provision (No 5.4) that retention or rehabilitation of existing remnant vegetation be encouraged with a catchment target of 50% of land area established with deep rooted perennial vegetation. These requirements resulted from the Stage 2 ERMP for the Peel Inlet and Harvey Estuary Management Strategy recommendations to minimise further phosphorous inputs to the estuary from agricultural activities.

As noted at Response 7.1 Proponents Commitment 10 will provide for the revegetation of 150ha of palusplain with perennial native vegetation which is congruent with the objectives of Statement of Planning Policy No 2 1992 The Peel-Harvey Coastal Plain Catchment.

2.1.10. Flood management

1 Design of bridges and river crossings should be consistent with Water and Rivers Commission advice and in accordance with Murray and Serpentine River Flood Studies. Note: A licence to construct is required from Peel Inlet Management Authority for bridge crossings. * There is concern that the bridge across the Murray River is proposed on a power bend. * The EMP should include flood management.

Response
The PER has been primarily prepared to address environmental issues and has not considered the statutory approvals required for construction of the road and bridges. The requirement for the Peel Deviation has however been incorporated into the Murray and Serpentine River Flood Studies, and floodway limits are shown on the Public Works Department drawings.

A natural river is a dynamic system in which a large number of variables (channel geometry, bed roughness, varying flow, sediment transport etc) are in a state of continual change. It is acknowledged that bridge construction can have significant effects on the river hydraulics as the crossing will generally impose some degree of encroachment on the river and/or the floodplain. The changes in flow regime caused by this encroachment have been the subject of much research and engineering models are available to predict the likely effects.

Amongst other factors, the bridge structures will take into account:

- The topography of the site and geometric characteristics of the river
- The hydraulic aspects of the waterway
- Soil conditions and the potential for scour
- Environmental considerations.

Local flood management forms part of the drainage system Commitment 4 of the PER document. Consultation with relevant authorities, and compliance with relevant statutory requirements will be undertaken during the design stage of the project.

2.2 POLLUTION MANAGEMENT

2.2.1 Particulates/Dust

1 There is concern regarding the levels of heavy metals in the region. The Peel Deviation will increase airborne transmission of heavy metals.

Response
In a regional context the Peel Deviation will not increase the overall emission heavy metals from vehicle sources, although it will result in a change in their regional distribution if current traffic volumes remain constant. The increased efficiency of traffic flows expected as a consequence of constructing the Peel Deviation compared to that of existing inter-regional roads (as detailed at Response 12.1) is likely to result in a net reduction of vehicle sourced emissions within the regional airshed.

It is widely recognised that vehicle sourced metal emissions are predominantly removed from roads through adsorption onto particulate matter. The subsequent dispersal of particulate matter from the road surface by wind and traffic generated turbulence is an important removal pathway and that the rate of deposition of pollutants on land adjacent to the motorway falls of rapidly with distance (Colwill et al, 1984). Kobriger et al (1983) found that atmospheric deposition of highway generated pollution appeared to be limited to within 35m from the edge of the road pavement at traffic volumes of 116 000vehicles per day. Regardless of the fact that the Peel Deviation is unlikely to support such high traffic volumes it can be concluded that unlike other inter-regional roads that pass through more concentrated development, including residential, dispersal of particulates will be predominantly contained within the road reserve.

2.2.2 Greenhouse gasses

1 The project should demonstrate compliance with the WA's Greenhouse Strategy which states we must "aim to reduce emissions from transport sources by 2005 through travel demand management, fuel and fuel substitution" (Recommendation 2b). This proposal seeks to satisfy demand, rather than manage it.

Response
The WA Transport, Urban Land Use and Planning Technical Panel (TULUP) was established by the West Australian Government to provide advice on the Western Australian Implementation Plan for the National Greenhouse Strategy (NGS) (Commonwealth of Australia, 1998) in the areas of Transport, Urban Land Use and Planning. In June 1999 TULUP reported to the WA Government on identified actions currently being undertaken by Government agencies that reduce greenhouse gas emissions from the transport, urban land use and urban planning sectors.

Among a range of strategies to comply with the NGS TULUP reported that the maintenance of vehicle travel speeds was a means of reducing vehicle sourced Greenhouse gas emissions. In this context the Peel Deviation can be considered to assist in reducing Greenhouse emissions by providing a more efficient free flowing transport route when compared to the existing routes to the south west –

- the existing Perth-Bunbury Highway now has six at-grade traffic signal controlled intersections compared to the Peel Deviation which will have none,
-
- the South Western Highway requires traffic to travel through numerous towns including North Dandalup, Pinjarra, Waroona, Yarloop, Harvey and Brunswick Junction. When passing through each town traffic is required to reduce speed to 60km/h before accelerating to highway speeds beyond the town's limits.

2 There is no evaluation of alternative transport strategies from a Greenhouse Gas perspective as is required by the EPA Greenhouse Policy "Greenhouse gas emissions for specific projects".

Response
As noted at Response 7.9 the Southern Province Transport Strategy (1998) considered all future transport requirements for the southern province of WA including, road, rail, air and sea transport. This Strategy identified the Peel Deviation, as the future extension of the Kwinana Freeway, as a future transport infrastructure requirement.

3 We need to reduce greenhouse gas emissions. * rail will have less greenhouse effect.

Response
The need to reduce Greenhouse gas emissions is recognised by Main Roads. As noted at Response 7.9 construction of the Peel Deviation was recognised as a required road link in the Southern Province Transport Strategy (1998), while 12.1 describes expected impact on overall Greenhouse emissions.

4 A transport strategy for the South West should be adopted by the Department of Transport based on total cumulative and extrapolated greenhouse gas emissions.

Response
This comment is noted although the development of a strategy based on total cumulative and extrapolated greenhouse gas emissions by the Department of Transport is beyond the scope of the Peel Deviation PER.

As noted at Response 7.9 the Southern Province Transport Strategy (1998) developed by a number of government agencies including the Department of Transport indicated the future requirement of the Peel Deviation.

2.2.3 Water - surface water quality

1 It is not adequate to relegate details of the potential for containment of accidental spills of hazardous goods to a Drainage Management Plan. Given the interlinked nature of wetlands on a Palusplain, the proximity of significant wetlands to the road (including Ramsar listed wetlands), the fact that the road crosses 8 agricultural drains which lead directly to the Estuary and the poor ability of the soils to absorb pollutants it is not appropriate to defer details on this issue. Information should be provided also on the volume or type of materials travelling from Kemerton (

particularly petroleum products) to determine proposed management measures. * It is inappropriate for materials from Kemerton to pass through this wetland environment.

Response
As no construction timetable for the Peel Deviation has been determined Main has proposed Commitments 4 and 5 to provide for the management of surface water to the approval of the DEP on advice from the Water and Rivers Commission at the project design stage.

The Surface Water Management Plan at Appendix 2 specifies the objectives of:

- retention of road and verge run-off to allow settlement of sediments,
- retardation of road runoff to prevent direct drainage to wetlands and rivers,
- containment of accidental chemical spills
- minimised scour impacts
- minimised visual impacts
- maintenance of existing drainage paths
- maintenance of existing palusplain east-west surface flows

This Concept has subsequently been endorsed by the Water and Rivers Commission.

Kemerton is only one of a number of destinations for dangerous and hazardous goods in the south west and it is impractical to consider this site in isolation. Regardless, vehicles transporting dangerous and or hazardous goods are required to comply with the relevant Department of Minerals and Energy Regulations. Main Roads has no regulatory control over the routes such vehicles travel.

2 Kerbing would be needed to prevent run-off containing oils and greases, or spills reaching the palusplain. Significant drainage infrastructure would also be required (eg. pipe system of 600 l/s capacity per km of freeway, concrete (not HDPE which floats) lined basins to trap oils and greases, 3 m3 of detention/m of freeway to provide 24 h detention) to treat drainage waters so that wetlands, particularly the significant wetlands nearby, are protected. The road reserve provides inadequate space for drainage. No details of emergency response for spills is provided. The PER ignores the need for specific drainage treatments and has not considered these costs, estimated at $10-11 million /km.

Response
Refer to Response 13.1 above.

Without a defined construction timetable and detailed design of the project it is not possible to calculate an accurate cost estimate at this time.

3 More information on the effectiveness of drainage design features in preventing nutrients and heavy metals from reaching the environment is needed. What are the probabilities of failure?

Response
Refer to responses to 13.1 and 13.2 above.

4 How can the EPA assess the feasibility of management of pollution impacts from drainage when no indication of pollutant loads are given in the PER. If loads are known could use Duncan H P 1997 Pollutant removal by storage: Analysis of Australian and overseas data Water 24 1 p19

Response
Refer to responses 13.1 and 13.2 above.

5 How much stormwater - and of what quality - is likely to end up in the Murray & Serpentine River drainage systems? - And what are the acceptable criteria.

Response
Additional stormwater entering the Murray and Serpentine drainage systems will come from the bridge approaches and bridge deck. Prior to discharge into the rivers the drainage will pass through appropriate designed retention basins as detailed in the Surface Water Management Plan at Appendix 2.

Road run-off water quality monitoring carried out by Main Roads in the south west and metropolitan area indicates that road run-off essentially complies with the Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA, 1993).

6 The proponent should be required to monitor turbidity increases & other water quality parameters on wetlands, rivers & streams (Section 6.4.1 of PER). There are no performance criteria. It is not satisfactory that this information is not in the PER.

Response
With construction of the Peel Deviation not expected for a number of years Main Roads considers that detailing monitoring requirements at this stage is premature. Proponents Commitments 4 and 5, and the Surface Water Management Plan at Appendix 2 provide for the management of road drainage using best practise to the requirements of the Water and Rivers Commission and DEP. Any monitoring requirements will be developed at that time.

7 The proponents should be aware of the report "The use of bauxite residue as a soil amendment in the Peel Harvey Coastal Plain Catchment" which suggests that pollutants associated with urbanisation and particularly those related to transport, have the potential to impact significantly on the Peel-Harvey Estuary.

Response
The specific report referred to was not referenced during the preparation of the PER.

2.3 Social Surroundings

2.3.1 Visual amenity

1 Where landscape values are high (eg. at the National Park) a proper landscape study is required. The PER does not address this aspect adequately. The current works at Myalup detract from landscape values.

Response
Detailed landscaping considerations of the proposed alignment will be considered at the detailed design stage of the project as noted at Proponents Commitment 10.

2.3.2 Heritage

15.1 No mention of June 1976 Peel Preston Study Aboriginal Heritage findings (See pages 2 &6).

Response
The 1976 Peel Preston Study Aboriginal Heritage survey only covers the area south of the Harvey Estuary. This project incorporated archaeological and ethnographic surveys of the proposed alignment. These surveys incorporate a review of the Sites Register maintained by the Aboriginal Affairs Department.

15.2 Figure 6a omits two known aboriginal ethnographic sites from the map.

Response
The Aboriginal Heritage Survey conducted as part of the Peel Deviation PER study included consultation with recognised Aboriginal community representatives who have had an interest in the project area, and a review of the Sites Register maintained by the Aboriginal Affairs Department. Additional sites will be assessed if the facts concerning them are provided.

15.3 Figure 6a omits a major section of bridle trail from Rogers Rd to Fiegerts Rd, and a replacement route is needed here.

Response
The bridle trail marked on Figure 6a was drawn from maps provided by local horse riding associations, no deliberate omission was intended.

Proponent's Commitment 18 provides for maintaining the 10th Light Horse Bridle Trail after construction of the Peel Deviation.

2.4 Other Matters

2.4.1 Adequacy of commitments

1 Proponents commitments 1, 2, 6, 14, 17, 18 should include Water and Rivers Commission and Peel Inlet Management Authority as clearing authorities.

Response
The Proponent is amenable to the addition of WRC and PIMA as additional clearing authorities for original PER Commitments 1 & 2 (now Commitment 2). Main Roads does not believe that the addition of WRC as clearing authority on original PER Commitments 4, 5 and 10 (now Commitments 7, 14 and 11) is appropriate and that the DEP & CALM are the most relevant authorities for approving original PER Commitments 6 & 14 (now Commitments 6 and 10.

2 Commitment 30 (now Commitment 21) should be expanded to identify responsibilities for minor road closures/re-alignments and construction and the process by which the required road works will be affected.

Response
As noted at Section 1.1 the Peel Deviation PER aims to identify the environmental impacts likely to arise from the proposal, and to recommend methods of managing those impact on the environment.

The issues raised in the submission are not specifically concerning environmental impacts of the project, although as the proponent Main Roads is responsible for the overall development of project. Main Roads is legally bound to maintain access to all properties affected by any of it's projects and recognises that the existing local road system will be modified to some extent by the Peel Deviation. The responsibility for local road closures and the construction of any required local road re-alignments rests with Main Roads WA in consultation with the local authority.

3 The Water and Rivers Commission and Peel Inlet Management Authority defer any support of proposed environmental management techniques until such time as Environmental Management Plans are satisfactorily prepared, and reserve the right to require additional criteria to be assessed under this plan.

Response
The WRC and PIMA comment is noted.

4 Issues adequately identified but commitment to "best management practices" and "future management plans" means PER does not demonstrate the issues can be managed to satisfaction of key stakeholders. A process of community involvement should be provided in detail for preparation of future management plans, and should include local groups. Two submissions considered no decision should be made until this information is available.

Response
Construction of the Peel Deviation is anticipated within the next 7-12 years. Section 6.1 of the PER and additional information provided by Main Roads in this report proposes best management practises (BMPs) defined under current policy and methodologies. The Commitments detailed in the PER (as revised in this report) provide for Main Roads to utilise BMP at the time of construction. These commitments provide for liaison with the appropriate government agencies during development of the detailed project design. As a matter of course Main Road will accept additional input from interested members of the community and community groups during the design phase.

5 Concerns that final proposal/management plan & commitments often differs from that proposed in environmental impact assessment. Suggest certification or quality assurance should be used.

Response
If the Peel Deviation is approved by the Minister for the Environment the commitments detailed in Section 6.0 the PER (as revised in this report) become legally binding on Main Roads throughout the implementation of the project. In addition, the auditing requirements detailed at Sections 6.2.1

and 6.2.2 of the PER, and audit requirements practised by the Department of Environmental Protection provide for the auditing of all Proponents Commitments.

The Proponents Commitments need to be able to consider changes in policy, practises and land use during the period between environmental assessment and detailed design while maintaining the intent of the commitment and EPA requirements.

2.4.2 Timing of assessment

1 Approval for this road is premature. Environmental awareness and sensitivity could change significantly in the 10-15 years before construction. If the proposal is approved, it should be conditional upon a review before construction.

Response
The environmental approval for this project is an exercise in forward planning. It will allow for the definition of a road corridor that will prevent ongoing and future uncertainty on the location of the alignment. The incorporation of the corridor into the Peel Region Scheme and local Town Planning Schemes cannot occur without environmental approval first being obtained.

It should be noted that the Peel Regional Strategy and the Inner Peel Region (Draft) Structure Plan stated an objective of identifying and defining land requirements for major infrastructure corridors. The timing of this study is therefore appropriate and has been requested by State planning agencies.

The potential for changes in environmental awareness and sensitivity is acknowledged and has been allowed for by the Proponent Commitments for the project. The management plans proposed for the project are pre-construction commitments that will require approval by relevant government agencies.

2 Flexibility is required to allow for protection of values which may not be apparent now. The PER infers little flexibility.

Response
The intent of the PER is to define a road corridor for the Peel Deviation section of the Perth Bunbury Highway which will provide an element of certainty for land use, planning and property development in the region. In this respect, the Preferred Alignment may be interpreted as having little flexibility, but it should be recognised that the alignment selected was done so to minimise environmental impact on wetlands and conservation reserves.

As already discussed, the preparation and approval of management plans prior to construction provides a great deal of flexibility in developing environmental management measures for the proposal. The Proponents Commitments can accommodate changes in practice and policy over time.

2.4.3 Support for various matters

1 Agree Northern 1.5 option satisfactorily avoids S6 & EPP lakes.

Response
This comment of support is noted.

2 Agriculture Western Australia supports the effort to protect as much deep rooted perennial vegetation as possible.

Response
This comment of support is noted.

2.4.4 Route planning considerations

1 The methodology used is flawed because it gives equal weight to each factor (eg. rare flora and the need for more earthworks). More importance should be placed on biophysical and social factors.

Response
It is unlikely that all stakeholders would agree on the allocation of weights to the various factors considered in the selection of the Preferred Alignment due to their diverse range of interests and priorities. The comparative assessment table is only used as a tool to compare the relative merits and disbenefits of the various route options considered.

2 Route alignment consideration did not, but should consider impact on prime agricultural land suitable for horticulture.

Response
Potential future land uses were not considered in the route alignment selection process nor is it realistic to do so.

2.4.5 Alternative routes or ways to meet demand, and questioning demand projections

1 The route should go through the pine plantation between C55 & C56 rather than through these System 6 areas.

Response

The southern alignment of he Peel Deviation was selected to balance the impact on remnant vegetation and pine plantation. Although of no intrinsic conservation value pine plantations are considered to have some economic value by their managers and this could not be ignored during the route selection process. This approach to minimise and balance impacts on various land use was an intrinsic consideration of the route selection process.

It should be recognised that the impact of the Peel Deviation on both the McLarty and Clifton MPAs was recognised in the System 6 Report (1983).

2 Alignment should cross Harvey River, through locations 812 & 814 (See Figure 1 attached) so that clearing of vegetation, on-going impact on CALM's operations and safety impacts from fires are minimised.

Response

The alignment suggested by the respondent is not considered to offer any overall benefit over the current PER preferred alignment when all environmental, social and construction impacts are considered. The current alignment at the southern end was selected:

- to reduce the property severance impacts on the private property east of Doman Road,
- to increase the separation between the road and wetlands protected under the Environmental Protection(Swan Coastal Plain Lakes) Policy 1992 that occur east of Domain Road,
- optimise the better topography and soils east of Doman Road. The suggested alignment crosses a significantly greater length of low lying land east of Domain Road whereas the preferred alignment utilises the slightly higher ground west of Domain Road. The preferred alignment will require a lesser height of road embankment and therefore the volume of fill materials required.
- to make use of the better underlying soils at the Harvey River bridge crossing at the location of the old railway bridge,
- the suggested alignment avoids impact on pine plantation in preference to impacting the Tuart peppermint woodland vegetation in the McLarty MPA.

The preferred alignment provides the opportunity for Main Roads to:

- purchase a 6ha severed portion of private property on the north eastern side of the Harvey River for addition to the Harvey River reserve (C 13 987),
- purchase 5.5 ha of severed private property south west of the Harvey River providing a link between the Harvey River reserve and the Clifton MPA System 6 area,
- close and rehabilitate the northern 1700m section (3.4ha) of Domain Road further enhancing the link between the Harvey River reserve and the Clifton MPA.
- develop a strip of vegetation between the pine plantation and the highway

3 The road would be unnecessary if * existing roads were upgraded (particularly Old Coast Rd, South West Highway and Old Bunbury Road - including underpasses to allow farmers access) * there was more emphasis on rail.

Response

The Perth-Bunbury Highway has been firmly established as the primary route between Perth and Bunbury to service the future development of the south west. As noted at Response 12.2 the Southern Province Transport Strategy (1998) considered future transport requirements for the southern province of WA and identified the Peel Deviation as a necessary future transport infrastructure requirement. The Strategy also considered the future requirements for all transport

options. As detailed in section 2.2 of the PER the Peel Deviation is the best alternative for providing a practical and economical means of developing a bypass of Mandurah linking the Kwinana Freeway Extension north of Mandurah to the Perth-Bunbury Highway.

To provide the necessary freeway/expressway standard road with interchanges at intersections the Old Coast Road through Mandurah, South Western Highway and the Old Bunbury Road are not realistic options compared to the Peel Deviation.

4 There is no demonstrated need for another major road.

Response
A justification for the Peel Deviation section of the Perth – Bunbury Highway is provided within Section 2.2 of the PER document. The proposal is required as a bypass of Mandurah, which is and will continue to experience significant traffic congestion in the absence of an alternative route.

As noted at Response 7.9 the Peel Deviation was identified in the Southern Province Transport Strategy as a requirement to avoid congestion in Mandurah and the Dawesville Peninsula, and to mitigate the problem of heavy vehicle use on the South Western Highway. The proposal is a component of an overall strategy to manage future transport requirements and as such, the regional implications of not constructing this route will be significant.

5 We prefer upgrading of the South Western Highway route, but although economics are considered the PER fails to assess the environmental impact of this alternative (Sections 2.2.1 & 2.2.3). This is a serious omission, given previous submissions sought evaluation of this option.

Response
The option of upgrading South Western Highway was considered in the early stages of planning for the Peel Deviation. As detailed at section 2.2.3 of the PER South Western Highway is not a practical alternative to the Peel Deviation because of the number of towns that will require bypasses. The Peel Deviation will achieve the State objective of a fast, free flowing freeway standard road link between Perth and Bunbury.

6 Alternative routes have not been adequately explored, with economics being the dominant determinant.

Response
See response to 20.3 and 20.5

7 This road will result in three parallel routes. Surely just two would be cheaper.

Response
The Peel Deviation will parallel the existing South Western Highway and Perth-Bunbury Highway through Mandurah to Lake Clifton. These roads do and will continue to provide different functions from that of the Perth-Bunbury Highway. In respect to overall transport costs including construction, operation and user costs Main Roads believes that the Peel Deviation is justified in the longer term development of the south west of WA.

This is recognised by its identification in the Southern province Transport Strategy as the key Perth-Bunbury road link.

8 The PER does not consider the issue of East- West road links – the SKM Pinjarra Bypass Study suggested that this should be considered by studies for the Peel Deviation. A deviation road closer to Pinjarra would reduce the length of cross links.

Response
The existing Mandurah-Pinjarra Road will provide a high standard dual carriageway east-west link to the Peel Deviation from Pinjarra. It is unclear how moving the Peel Deviation alignment further east will improve the issue of east-west links.

9 The PER was dismissive of alternative options and did not take into account the proposed Pinjarra Bypass.

Response
The issue of alternative alignments was addressed in section 2.3 of the PER. The alternative options were considered in sufficient detail to be to assess their appropriateness. The Pinjarra Bypass is planned to reduce the impact of traffic on residents in the Pinjarra townsite and does not have any direct impact on the route of the Peel Deviation.

10Figure 2 shows a preferred alternative.

Response
Main Roads preferred alignment was selected to minimise and balance the predicted impacts on both the biological and social environment with consideration for the engineering and economic implications of road construction.

The alignment suggested is similar, although slightly to the west of Southern Option 2 considered in the Route definition stage of the study. Southern Option 2 was rejected by Main Roads because of its significantly greater severance impact on private properties, the proximity of existing houses and the fact that it traverses poorer quality embankment foundation soils at the Harvey River crossing and across the flat country east of Doman Road.

In determining the preferred alignment through the State Forest an attempt was made to balance the impacts between Tuart Peppermint woodland vegetation and pine plantation.

11The southern end of the road should continue along the southern boundary of the McLarty Plantation to just past Johnstone Rd to reduce property severance, splitting McLarty Reserve, and to allow Old Coast Rd to become a scenic drive.

Response
Main Roads preferred alignment was selected to minimise and balance the predicted impacts of the Peel Deviation on both the biological and social environment with consideration of the economic and

engineering implications of road construction. The alignment identified in the PER continues to have Main Roads support as the preferred alignment.

12We propose that the deviation be re-located to cross Patterson Road, the follow the inside alignment of boundaries of lots 1, 2, 209 & 201, proceeding along the road reserve adjoining lots 205, 204 & 190 and long the boundary of Lot 189 to minimise disruption to farming properties and locate the route on higher land.

Response

Alternative alignments for this section of the Peel Deviation were the focus of additional investigation by Main Roads since the PER was put out for public comment. Consideration of alternative options is detailed at the front of this report. The additional assessment of the northern route options confirmed the preferred alignment as the best performing option for this section of the Peel Deviation.

13There was no consideration of alternative transport systems, and the PER did not address issues raised by the Southern Province Transport Strategy, nor discuss alternatives raised in that strategy. What consideration has been given to alternatives such as rail?

Response

As previously noted at Response 7.9 the Southern Province Transport Strategy identified the Peel Deviation as a future high standard road link between Perth and Bunbury. Subsequently the Peel Deviation PER has been prepared to specifically address the impacts of the road project.

14Justification for this proposal depends on the Kwinana Freeway extension to Mandurah being built first, but alternatives which did not include this option were not considered.

Response

The Peel Deviation forms the ultimate link between the Kwinana Freeway extension to Mandurah and the Perth-Bunbury Highway at Lake Clifton. Construction of the Peel Deviation is not expected to occur until after the extension of the Kwinana Freeway to Mandurah, however a study is currently underway to determine the likely benefits of constructing the Pinjarra Road to Lake Clifton section on reducing traffic congestion in the Mandurah peninsular area prior to completion of the ultimate freeway.

15The PER did not address the guidelines which required a "detailed analysis of alternatives considered and why they were not selected"

Response

Consideration of alternatives to constructing the Peel Deviation, as detailed at Section 2.3 of the PER, was made during the early stages of the planning process. Alternatives to the Peel Deviation were considered in sufficient detail to substantiate their rejection. A more detailed assessment of those options was not considered warranted

16A submission prepared on behalf of five submitters provided a detailed referenced response to the Southern Province Transport Strategy which justified the Peel Deviation. Concerns raised

include * traffic forecasts are flawed because they assume continued oil supply * dependence on construction of the Kwinana Freeway to Mandurah * the strategy will result in significant air pollution, congestion, accidents and noise from traffic with the economic costs exceeding investment in roads * the cost of rail would be far cheaper when secondary impacts are considered.

Response
The draft Southern Province Transport Strategy was made available for public review and comment. Any comments concerning that Strategy should have been submitted to the Department of Transport at the appropriate time. Main Roads is not in a position to comment on the development or recommendations of the Strategy, not is it within the scope of the Peel Deviation PER.

17By 2020 oil supplies will be reduced (see Brian J Fleay, 1995, "The decline of the age of oil") so we should be building railways not roads and encourage public transport. * One submission prepared on behalf of five submitters included detailed reference material to highlight the coming decline in oil supplies covering aspects such as reliability of estimates, Australia's likely position, the future of transport, likelihood of alternative fuel supplies, likely impact on traffic forecasting etc.

Response
The construction of the Peel Deviation will be dependent on on-going monitoring of traffic volumes. Should traffic growth decline for whatever reason then the likely construction timing of the road will be deferred accordingly.

18The decline in oil has not been factored into the projections for vehicle traffic in the PER.

Response
Refer to 20.17 above.

19No traffic forecasts are given, nor dates for construction.

Response
Uloth and Associates have prepared traffic forecasts for the City of Mandurah based on Mandurah Town Planning Scheme No. 3. This report (Mandurah Road Hierarchy Update – May 1997) predicts the following traffic volumes for the Peel Deviation in 2021.

Location	Peak Hour (vehicles)	Vehicles per Day (vpd)
South of Kwinana freeway connection	5,430	54,300
South of Lakes Road	4,250	42,500
South of Pinjarra Road	1,370	13.700

At the same time (2021) traffic volumes on Old Coast Road south of the Mandurah Bypass are predicted to be 61,900 vpd, and on the Mandurah Bypass, 65,500 vpd.

Main Roads are currently reviewing the forecasts prepared by Uloth and Associates. It is expected that any dispute will be in the timing rather than the size of the traffic predictions.

Dates for construction have not yet been nominated as the need to construct will depend on the increase in traffic volumes on the Perth Bunbury Highway and the growth of Mandurah. It is anticipated however that the Peel Deviation will be required in the 7 to 12 year time frame from the present day. The current PER has been undertaken to identify an environmentally acceptable route, that can be protected in regional and town planning schemes to allow future construction when the need arises. Main Roads will continue to monitor traffic growth and congestion on the Perth Bunbury Highway and the detailed design and land acquisition phases of the project will commence at the appropriate time.

2.4.6 Planning-related comments

1 The Peel Deviation will bring unacceptable development pressure along its route which would increase vegetation clearance and pollute the Peel-Harvey Estuary (fertiliser, hydrocarbons, pesticides). * The route cannot be supported until legal controls consistent with the Draft Inner Peel Region Structure Plan preventing such development are in place. * Concerned that development pressures will be too great for government to resist. * Is this a back door method of getting urban development east of the Estuary? * If the EPA accepts this road they should accept blame for subsequent development pressure and urbanisation. * This will bring development pressure to the foreshores * The deviation is already being promoted by the Birchmont development as easy access to it. * Should the Peel Regional Park be given legal standing, and zonings made binding the proposed route may not be so unacceptable from the development pressure viewpoint.

Response

* The Peel Deviation is an inter-regional transport route, issues of surrounding development are controlled through the planning process. Most of the land surrounding the Deviation is currently, and in the long-term planned to be rural (Ministry for Planning, 1999). Applications for rezoning and development will need to undergo a separate approvals process, where the impacts of such proposals will be assessed.
* The Peel Deviation proposal cannot be held responsible for decisions made relating to other hypothetical proposals.
* The proponent is not responsible for Governmental response to development pressure.
* Main Roads WA is responsible for the construction and maintenance of the State road network. The Department has no charter for, nor interests in issues of urbanisation.
* Main Roads WA cannot comment on this statement.
* The Peel Deviation is an inter-regional route and is not intended to increase local level access.
* Statements made by the Birchmont developers are not the responsibility of the proponent.
* This comment is acknowledged.

2 The PER is pre-empting the Peel Region Scheme, which may or may not include the Peel Deviation.

Response

The selection of a route and preparation of environmental documentation for the Peel Deviation was an objective within the 1994 Peel Regional Strategy and the 1996 Inner Peel Region (Draft) Structure Plan. An indicative alignment for the Peel Deviation was included within the latter strategy and the current detail is a response to that document. The alignment and proposal are consistent with the existing planning framework and the PER process is a natural progression of the planning process.

The PER pre-empts the Peel Region Scheme only in that the environmental approval is being sought external to the environmental assessment of the Peel Region Scheme. The omission of the Peel Deviation from the Peel Region Scheme would be in direct contradiction to the objectives and directives of existing planning strategies. The content of the Scheme is not however the direct responsibility of the Proponent.

3 The road will cause fragmentation of agricultural properties, which the Draft Inner Peel Region Structure Plan says should be avoided (p21).

Response
The Draft Inner Peel Region Structure Plan states that extensive land fragmentation of the agricultural areas through subdivision should be avoided. This statement refers to the issue of urban subdivision of rural land and is not prohibitive of the Peel Deviation proposal.

The Peel Deviation alignment has been selected to optimise lot and landowner boundaries where ever possible to minimise fragmentation and severance issues.

4 To ease development pressure and protect rural aspects the road should a freeway with overpasses over local roads (ie. no connection to local road system).

Response
Main Roads believes that construction of a road without provision for its use by adjacent and nearby landowners would be unacceptable to the community, particularly those likely to be directly affected by the road. As such reasonable local access to the Peel Deviation at controlled locations will be provided to the local road system.

5 If Kemerton becomes a major industrial area, rail rather than road should be used.

Response
This proposal is not related to the development of Kemerton as an industrial area. It is an inter-regional road route to connect Perth with Bunbury while bypassing the residential areas of Mandurah and the Dawesville Peninsula.

The development of a rail connection to Kemerton is being planned as a separate project to the Peel Deviation by the WA Government (WAPC, 2000).

6 As the pulp mill is not proceeding at Kemerton, there is no need for the road. * Kemerton Industrial Park has not been a success and no other industrial development is planned which would justify the need for the road.

Response
As stated above, the justification for this project has no relation to the Kemerton industrial area.

7 The road will lead to more mineral mining in the area affecting property values. Several tenements already exist.

Response
There is no connection between construction of the Peel Deviation section of the Perth - Bunbury Highway and any mining developments as land use and mining lease applications have separate approvals processes.

2.4.7 Miscellaneous comments

1 More consultation should have occurred before the PER release, as was required by the Guidelines.

Response
Chapter 4.0 details the public consultation associated with the Peel Deviation project as required by the Guidelines. The Guidelines do not specify the amount and nature of consultation required for any project, and any comment on extent of consultation is subjective.

2 Some key stakeholders were not invited or not allowed to speak (See Minutes consultative group meeting 25/10/95) in early consultation.

Response
The CLG was established as an advisory group to facilitate the transfer of information between the community and Main Roads. By necessity, groups of this nature have to be limited in size in order to function effectively. The CLG included a range of government agencies and community group, which by necessity was limited in size in order to function effectively. Spokespersons were nominated for the respective interest groups to provide the input of their stakeholders at the CLG meetings.

The CLG was only one aspect of the community consultation programme with public comment invited through newsletters, public displays and on-site meetings. Opportunity for community input has be provided and encouraged throughout the development of the Peel Deviation project.

3 We recommend that this project not be allowed to proceed until the System 6 Update is completed.

Response
In the absence of a blanket suspension of any environmental assessments within the System 6 area, it is anticipated that the assessment will continue based upon the existing information available. The PER takes full account of existing System 6 areas and recommendations for their future management.

4 Environment Australia would like to comment on the duplication of Old Coast Road when this proposal is developed.

Response
Comment is noted.

5 The median width should be reduced from 40 to 20 m so as to reduce the reservation requirements.

Response
The 40m median width has been determined to ensure for an adequate separation between carriageways, provide for the establishment of a self sustaining width of vegetation within the median and manage off –road drainage.

6 A statement on the potential impact of increased traffic, nature of traffic and loads, possibility of a service station, and drainage management from the highway onto the Ramsar listed Peel-Yalgorup wetlands is required.

Response
As detailed at 20.19 above traffic volumes in the region are increasing and continuing to increase at a rate of some 7% per annum.

The issue of service stations and other developments adjacent to the road is outside the direct control of Main Roads and beyond the scope of the PER. The development of service stations won the Peel Deviation would be subject to a separate approval process.

Issues relating to drainage management are addressed at Sections 7, 8 9 and 10 above.

7 The PER is a failure because it does not consider the full social, economic and environmental consequences of the traffic implication of the deviation and associated north-south freeway. The PER should be re-done if the deviation appears in the Peel Region Scheme.

Response
The PER addressed the issues identified as requiring consideration in the Environmental Protection Authority's Public Environmental Review Guidelines for this project. The PER and this Response to Public Submissions provides the EPA with information on the potential environmental impacts of the project and proposed management measures that it will consider, with advice from other relevant government agencies, before making a recommendation to the Minister for the Environment on the environmental acceptability of the proposal.

8 The PER failed to address impacts on the farming community.

Response

The PER referred to land acquisition, access and severance issues relating to all directly impacted landowners while Proponents Commitments 19, 20 and 22 address specific landowner impacts of

the proposal. Issues relating to individual property management and compensation are addressed through established Main Roads WA practice during the process of land acquisition.

9 Concerned project viability not proven, but money for the road will probably be borrowed and have to be paid back by future generations. Road transport is a costly option to be funded by taxpayers! * Concerned road is to support "pie in the sky" urban developments, and have no confidence in traffic forecasts.

Response
The justification for the Peel Deviation is detailed in Section 2.2 of the PER.

Allocation of funding for the design and construction of the Peel Deviation from Main Roads budget will be determined once regional traffic volumes indicate that the Deviation is required. The source of Main Roads funds is determined by the State Government.

The provision of infrastructure, including roads, for the benefit of the West Australian community is a primary function of the State Government. The benefit to the community of an efficient road transport system is lower transportation costs, which are then reflected in the cost of consumer items and services.

The Peel Deviation PER is being undertaken to determine the future road alignment. As noted previously local and regional developments are the responsibility of the Ministry for Planning and Local Authorities and beyond the control of Main Roads.

The methodology of traffic forecasting extrapolates future traffic using a series of known values such as existing traffic volumes and historical traffic growth rates with a number of predicted variables such as future traffic growth and traffic generation from proposed landuses. Like any forecasting the accuracy of the prediction is reduced as the time span increases. Traffic forecasting is a useful tool for predicting future road planning. Unless planning is done at an early stage route options are either lost or become socially disruptive to implement and very expensive.

10No consideration given to integration of project with landcare activities.

Response
The level of detail required to consider individual landcare projects is beyond the broader scope of the PER, although Main Roads would in principle co-ordinate it's landscaping and drainage design with these projects.

11No mention of June 1976 Peel Preston Study, particularly Section 1.9.2, page 30, Section 4.9 and Section 4.9.5. Why wasn't this study included or referred to?

Response
Essentially, the PER was prepared based upon the most recent information available. The 1976 report is outdated and has been superseded by the Peel Region Scheme, Inner Peel Region Structure Plan and numerous other studies.

12Given the accuracy of Figure 6a (See comments under Heritage), doubt accuracy of PER.

Response
It is unreasonable to make the assumption that an entire document is inaccurate because of alleged errors in a single figure. The PER has been prepared from a variety of sources using the best available information. Some small errors and minor omissions may be present in the report but this should not be taken to reflect the accuracy and integrity of the entire document.

13The Peel Deviation should not proceed. * The PER provides an inadequate basis for decision-making. * there should be no more main roads through a major wetland system.

Response
The assessment of the adequacy of the information within the PER and whether the project should proceed is to be assessed by the EPA and is the point of the formal process required under the Environmental Protection Act 1986.

14The EPA should focus on population issues.

Response
This comment is noted but is not relevant to the PER and is a policy matter for the EPA to determine.

15Water Corporation planning for water, sewerage and drainage should be taken into account (Contact Manager Planning & Development, Bunbury office).

Response
Consultation with the Water Corporation and other service authorities is part of Main Roads standard practise and will be conducted at a time nearer to the design and construction of the road. It should be noted that the scope of the PER is specifically to address environmental issues in determining the environmental acceptability of the proposal and specific requirements of other service authorities is beyond that scope.

16Can the Public Service be respected or does it give advice "compromised and browbeaten" by government. Do the EPA and Ministry for Planning * consider increasing populations require a whole of government approach; * provide their Ministers with hard facts so the community can judge the performance of elected representatives or with what they consider will be acceptable.

Response
Comment noted.

2.4.8 PER Corrections requested

1 The Shire of Serpentine-Jarrahdale has been missed for the description of the Peel Region so the area is underestimated (Section 3.1 of PER).

Response
According to the Inner Peel Region Structure Plan, the composition and area of the Peel Region as outlined within the PER is correct.

2 Paragraph 2 infers there is a public dam on the Murray River. This is not the case.

Response
The intent of the paragraph referred to is merely to outline the extent of alteration to natural drainage systems in the region.

3 Section 5 of the PER should add the Waterways Conservation Act 1976 and Water and Rivers Commission Act 1995 to the legal framework.

Response
The addition of these Acts to the legal framework is accepted.

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APPENDIX 1

REVIEW OF NORTHERN AND SOUTHERN ALIGNMENT SECTIONS

REVIEW OF NORTHERN AND SOUTHERN ALIGNMENT SECTIONS

INTRODUCTION

During the course of the Peel Deviation Public Environmental Review submissions a number of requests were received to review the Peel Deviation alignment as a result of property impacts. Similar requests were made outside the PER process directly to Main Roads and the Minister for Transport.

Given the strong political lobbying of the impacted landowners it was necessary to carefully review a number of landowner suggested alternative alignments to assure the Minister for Transport that the preferred PER alignment provided the best outcome for the community as a whole.

Alternative alignments were proposed for the northern section of the Peel Deviation between Lakes Road and South Yunderup Road, and the southern section between Doman Road and the connection of the Peel Deviation with the Old Coast Road.

ALTERNATIVE NORTHERN ALIGNMENTS

WHY INVESTIGATE ALTERNATIVE ALIGNMENTS?

The Public Environmental Review document proposed for the Peel Deviation alignment to pass through a number of farming properties between Paterson Road and Pinjarra Road. This alignment would result in a severed portion of these lots remaining between the Deviation and Fiegerts Road. The lots affected are (from north to south) 4, 3, 208, 207, 202, 203 and 192.

Submission No 20.12 to the PER proposed to realign the Deviation further east alongside Paterson Road. This proposal was also forwarded in correspondence and presented at a number of meetings with Main Roads and the Hon Minister for Transport by the landowners impacted by the PER alignment. Additional investigation of this alternative alignment was required to enable a response to the Minister for Transport and to the PER submission.

THE ALTERNATIVE ALIGNMENT

Based on the landowners suggestion an alternative alignment Northern 3 (N3) was documented for further investigation. Alignment N3 was concurrent with the PER alignment until south of Lakes Road where it moved further to the east and travelled along the western side of Paterson Road to a Murray River crossing further east of the PER proposal and rejoining the PER alignment at South Yunderup Road. The N3 alignment is shown at Figure 1.

A standard diamond interchange with Pinjarra Road was to be located near the current Pinjarra Road – Old Mandurah Road intersection.

ALTERNATIVE ALIGNMENT IMPACTS

ALTERNATIVE ALIGNMENT BENEFITS

The landowners impacted by the PER alignment argued that the alternative N3 alignment had the following benefits;

- reducing the land severance issue from lots noted above,
- reduced impact on existing farming operations,
- moved the alignment further east from Nambeelup Pool and Black Lake,
- increased scope for future special residential/special rural subdivision west of the Peel Deviation,
- provided a more common "diamond" style interchange at Pinjarra Road rather than the "partial clover leaf" interchange originally proposed because of the proximity of the Murray River.

ALTERNATIVE ALIGNMENT CONSTRAINTS

After consideration by Main Roads it was found that the N3 alignment had the following constraints;

- increased area, length and severance impact to Lot 220 which was only slightly impacted previously,
- increased length of construction and travel distance with associated negative economic impact,
- no overall environmental benefit,
- impact on recently approved subdivision on Old Mandurah Road,
- required a heavily skewed crossing of the Murray River resulting in increased bridge length and cost,
- the Murray River crossing location had wider floodplain width requiring additional bridge length and cost,
- alignment would impact on a substantially developed subdivision south of the Murray River requiring the purchase and demolition of three existing riverside homes,
- alignment would be moved closer to residential development that has occurred in full knowledge of the previous alignment documented in appropriate Town Planning Schemes.

CONSULTATION

Personal interviews were held with each of the landowners that would have increased impacts as a result of the alternative N3 alignment.

These interviews confirmed that most landowners purchased and developed their properties after giving consideration to the Peel Deviation alignment as previously planned by Main Roads and documented in the Shire of Murray Town Planning Scheme.

It was widely recognised in the community that one of the three landowners north of the Murray River proposing the alternative alignment had in fact purchased their landholding in full knowledge that the documented alignment of the future Peel Deviation would impact on that property.

THE PER ALIGNMENT TO BE PROGRESSED FOR ENVIRONMENTAL APPROVAL

As an alternative alignment could not be found without unacceptable increases in impacts the Minister for Transport endorsed the originally proposed alignment as documented in the PER as that to be progressed for environmental approval.

ALTERNATIVE SOUTHERN ALIGNMENTS

WHY INVESTIGATE ALTERNATIVE ALIGNMENTS?

The Public Environmental Review document proposed for the Peel Deviation to pass through Location 57 before rejoining the existing Old Coast Road alignment (see alignment drawing attached at Figure 2). Location 57 abuts the existing Old Coast Road and is operated as a grazing and limestone quarrying operation by the Tyler family. There is also a residence on the northern portion of Location 57.

As the future interchange at the Peel Deviation/Old Coast Road intersection is proposed Location 57 is impacted by a substantial land requirement.

The Tyler's corresponded and met with the Minister for Transport on a number of occasions requesting that alternative alignments be considered that had a reduced impact on the Tuart Woodland and avoided their landholding. Main Roads was subsequently requested to give consideration to alternative alignments that avoided impact on the Tyler's property.

It is understood that the Tyler's did not make a submission to the PER process suggesting alternative alignments on environmental grounds.

CONSULTATION

As any change in the alignment would impact on the incomplete PER process discussions where held with CALM and DEP officers as to the appropriate course of action and level of investigation required to support a possible change in alignment.

DEP officers advised that as likely alternative southern alignments would be contained within the land owned by the Tyler's or managed and CALM then these parties were to be consulted and offered the opportunity to comment formally on any alignment changes. Separate meetings were subsequently held with the Tyler's and CALM officers in January 1999 to discuss the process of identifying alternative alignments.

THE ALTERNATIVE ALIGNMENT

Main Roads investigated alternative alignments with particular attention focused on alignments running to the south, but as close as possible, to the PER alignment for the following reasons.

A move to the north would;

- increase environmental impacts on remnant Tuart Peppermint woodland in State Forest System 6 areas proposed for addition to the Yalgorup National Park,
- impact on a previously unaffected private landowner whose land is predominantly uncleared Tuart Peppermint woodland,
- increase length of ultimate highway/freeway passing Lake Clifton which is understood to be of concern to Environment Australia,
- move ultimate highway/freeway closer to existing special rural subdivisions,
- still require land acquisition from Tyler property to support dual carriageway past Location 57,

- severe both Tyler residences from farming operations on the west of the current highway alignment.

A move considerably further south would;

- increase length of parallel road network with an associated economic disadvantage,
- increase the length of road and subsequent clearing areas within remnant Tuart Peppermint woodland in State Forest System 6 areas proposed for addition to the Yalgorup National Park.

An alternative alignment meeting engineering characteristics and design criteria set for the Peel Deviation was selected for further investigation. This alternative alignment called Southern 3 Modification 3 (S3 Mod3) was concurrent with the PER alignment until part way along Doman Road, where it continued to run parallel to Doman Road until Coronation Road before swinging to the south west and connecting with the Old Coast Road south of Peppermint Grove Road. The S3 Mod3 alignment is documented at Figure 3 attached.

ALTERNATIVE ALIGNMENT IMPACTS

ALTERNATIVE ALIGNMENT BENEFITS

It was observed that the alternative alignment S3 Mod 3 had the following benefits;

- a standard diamond interchange could be provided with Old Coast Road,
- two side roads, Old Coast Road and Peppermint Grove Road could be brought together at the one interchange/intersection,
- removed the Tyler property accesses as a constraint,
- removed the heritage listed "Fouracres Cottage" as a constraint, and
- traffic was moved further south away from Lake Clifton.

ALTERNATIVE ALIGNMENT CONSTRAINTS

- area and length of impact on remnant Tuart peppermint woodland in State Forest was some 50% greater than that of the alignment proposed in the PER,
- impacted on two small vegetation communities that are similar to the unreserved and susceptible Community Type 26a – "*Melaleuca huegllii – M. acerosa* shrublands of limestone ridges,

It is recognised that other alternative alignments further to the south that avoid the vegetation Community Type 26a are possible; however these would further increase the length and area impacts on remnant Tuart Peppermint woodland proposed for addition to the Yalgorup National Park, and the engineering and economic benefits of the alternative alignment would be diminished.

THE PER ALIGNMENT TO BE PROGRESSED FOR ENVIRONMENTAL APPROVAL

Based on the level of environmental impacts CALM and the Land & Forest Commission confirmed that they could not support the alternative alignment S3 Mod3. As no alternative alignment could be found that did not have unacceptable increases in environmental impacts the Minister for

Transport endorsed the originally proposed alignment as documented in the PER to be progressed for environmental approval.

Conclusion

The PER alignment was selected after an extensive road alignment definition study and consultation with land owners, local government, DEP, CALM, other state government agencies and community conservation groups.

However alternative alignments were proposed in submissions to the PER, forwarded in correspondence and presented at a number of meetings with Main Roads and the Minister for Transport by the landowners impacted by the PER alignment.

Main Roads has subsequently considered landowner suggested alternative alignments for the northern portion of the Peel Deviation alignment between Lakes Road and South Yunderup Road and for the southern portion of the alignment between Doman Road and the Old Coast Road. After a review of the alternative alignments it was found that there was no net benefit in either of the alternative alignments over the Peel Deviation alignment documented in the PER.

The Minister for Transport has subsequently endorsed the PER alignment as that to be progressed through the environmental approvals process.

APPENDIX 2

SURFACE WATER MANAGEMENT PLAN

SURFACE WATER MANAGEMENT PLAN

1.0 INTRODUCTION

Proponent's Revised Commitment 4 states that Main Roads will develop a Surface Water Management Plan (SWMP) for the various stages of the Peel Deviation project.

The intention of the SWMP is to document required design features and activities to ensure that the project when constructed will provide adequate protection of water availability and water quality through the management of road runoff and containment of accidental spills.

The objective of Proponent's Revised Commitment 4 states:

"To minimise and mitigate impacts on the environment by:

- maintaining the existing surface hydrology characteristics within the project area
- Preventing deleterious impact on water (surface and ground) quality from the Peel Deviation project
- minimising erosion due to the proposal
- preventing direct discharge of surface water runoff from the project to the environment
- preventing spillage of hazardous goods to the adjacent environment."

This SWMP has been prepared to support the "Proponents Response to the Summary of Submissions" and reflects the drainage philosophy and concepts to be applied to meet the environmental objectives of this project.

As the Peel Deviation project is not due for construction for some 7 – 12 years the SWMP will be updated as required and the level of detail increased as design activities progress. Such updates will include possible improvements in drainage management techniques, advice from stakeholders and Government Authorities and possible changes in legislative requirements.

2.0 SURFACE WATER MANAGEMENT PLAN FEATURES

The associated drainage measures to be provided on the project are to support the following features;

- Retain road and verge runoff to allow any sediments to settle out,
- Retardation of road runoff to prevent direct drainage to wetlands and rivers,
- Containment of accidental spills,
- Minimised scour impacts,
- Minimised visual impacts,
- Maintenance of existing drainage paths,
- Maintenance of existing palusplain east west surface flows.

Note that details such as the Average Recurrence Interval (ARI) rainfall and flow events, allowable backwaters and flow velocities to be used in the design of waterways structures and retention facilities will be resolved to the satisfaction of the DEP and WRC during the refinement of the DMP given best practice at the time of detailed design and construction.

3.0 STAKEHOLDER CONSULTATION

During the refinement of the SWMP it is expected that the following stakeholders and government authorities will be consulted;

- Peel Inlet Management Authority,
- Pinjarra Community Catchment Centre,
- Water & River Commission,
- Department of Environmental Protection.

4.0 SURFACE WATER MANAGEMENT PLAN APPROVAL

It is anticipated that the final SWMP will require the approval of the Water and Rivers Commission (WRC) and the Department of Environmental Protection (DEP).

5.0 MANAGEMENT OF ROAD RUNOFF

A significant issue in relation to the wetlands in the vicinity of the project and the palusplain through which the alignment passes is the protection of water availability and water quality particularly with regard to the management of road runoff and the containment of accidental spills.

The importance of this issue is reflected in Proponents Revised Commitment 4.

A concept system for the satisfactory retention of road runoff before discharge into waterways and wetlands has been developed. This concept is based on that used for the Kwinana Freeway extension to Safety Bay Road but has been modified and simplified given that extensive noise bunding is not anticipated for the Serpentine/Peel Deviations and to reflect the predominantly rural environment through which the road passes.

The proposed drainage concept to manage road runoff follows is sketched at Figure 1. Such provisions will be made where appropriate to ensure road runoff does not directly discharge into wetlands and rivers and is of suitable quality when it does.

Typically road runoff will flow down the 3% one way cross-fall to be captured and retained in a linear swale along the road verge. Note that road runoff will only flow into the median on curved sections where the pavement is in superelevation.

In the event of large flow events discharge from the linear swale will be controlled through side weirs at appropriate separations. The linear swale capacity and side weir levels will be selected to

ensure retention of the ARI rainfall event specified by the WRC. Scour protection will be provided to the side weirs as appropriate.
The level of the bund forming the linear swale, and associated side weir levels, must also be set to ensure adequate freeboard from the palusplain water level and to providing sufficient protection to the road pavement from water ingress. The bund batter slopes will be similar to MRWA standard slopes for drains and cuttings to ensure a safe roadside environment for errant vehicles. The batter will be of such a slope to allow revegetation and to minimise visual impact from neighbouring properties.

Note that Figure 1 does not show the full extent of rehabilitation for reasons of clarity.

Where the road pavement is in superelevation and the runoff flows towards the centre of the dual carriageway the median will act to capture and retain flows in a similar fashion to the linear wetland in the verge. The level of the drainage grates will be set similarly to the side weirs in the linear swale such that retention as agreed with WRC is provided.

These drainage concepts will separate the retained road runoff from any transverse drainage crossings to prevent direct drainage to wetlands and rivers in accordance with Proponents Revised Commitment 4.

The design criteria and drainage management concept are to be developed in consultation with relevant stakeholders and approved by the DEP and WRC as a component of the SWMP.

6.0 MANAGEMENT OF EXISTING DRAINAGE PATHS

The construction of the road formation has the potential to impact on existing drainage paths. As such all design of road structures and associated drainage structures is to give consideration to ensuring that these paths are not significantly impacted.

6.1 FORMALISED LAND DRAINS

Drainage structures are to be provided to the numerous formalised land drains. These structures will be the subject of detailed waterways investigation with design ARI flow events, allowable backwater levels and allowable flow velocities to be resolved in discussion with the WRC.

As these man made drains typically carry smaller flows and do not have natural fringing vegetation the required structures are likely to consist of reinforced concrete culvert pipes or boxes. Flow velocity is to be carefully considered and scour protection provided if necessary.

These works are to be implemented to the satisfaction of the DEP and WRC in accordance with Proponents Revised Commitment 4.

6.2 NATURAL WATER COURSES, RIVERS AND FLOODPLAINS

Appropriate drainage structures are to be provided to all natural drainage channels, brooks, rivers and floodplains. The design ARI flow events, allowable backwater levels and maximum flow velocities are to be resolved in discussion with the WRC.
Large bridge structures will be required at crossings of the Serpentine, Murray and Harvey Rivers. Smaller bridge structures or large culverts will be required at a number of natural water courses such as Nambeelup Brook and the Murray River Floodplain.

Consultation will be required with the WRC regarding the selection of bridge lengths to minimise clearing of river bank vegetation for construction.

During the detailed waterways investigation flow velocity is to be carefully considered and velocities kept sufficiently low wherever possible such that modification of existing naturally vegetated watercourse banks is not required to support formalised scour protection.

These works are to be implemented to the satisfaction of the DEP and WRC in accordance with Proponents Revised Commitment 4.

6.4 PALUSPLAIN DRAINAGE

During winter and early spring the palusplain areas (mostly south of the Murray River) become inundated. This water body has a very slow east west flow towards the Peel Inlet and Harvey Estuary.

Culvert structures will be provided at intervals agreed with the WRC to maintain the hydrological characteristics of these east west flows. The provision of such culverts has been allowed for in the concept for the management of road runoff as detailed in Figure 1.

7.0 CONCLUSION

This Surface Water Management Plan will be developed and refined as design and stakeholder consultation progresses with a view to being best practice at the time of final design and construction. All drainage design criteria and resulting concepts and design details are to be detailed in the final version of this document.

The final SWMP will give consideration to all drainage issues associated with the Proponents Commitments and be approved by the WRC and DEP.

APPENDIX 3
PEEL DEVIATION PROPONENTS COMMITMENTS

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
1	Environmental Management Programme (EMP)	Prepare an EMP which includes: • dieback management plan • vegetation management plan • fauna management plan • rehabilitation and landscape plan • surface water management plan • construction management plan • foreshore management plan •	To minimise and mitigate impacts on the environment	Pre-construction	DEP		EMP submitted for approval
2	Environmental Management Programme (EMP)	Implement the Environmental Management Programme	To minimise and mitigate impacts on the environment	Pre-construction, Construction, and Post construction	DEP	others as nominated for specific issues in the EMP	Performance and Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
3	Noise – Assessment, mitigation and monitoring	• Noise impact assessment shall be carried out for the final road design and noise mitigation techniques implemented to comply with Main Roads Traffic Noise Policy in force at the time of construction • Monitor road noise during the first year of operation to demonstrate successful management and make the results publicly available • Provide advice on the need for noise mitigation measures for any subsequent proposed developments adjacent to the road that are referred for advice	To manage the impacts of traffic noise	Pre-construction and Post construction Post-construction Post-construction	DEP		Performance and Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
4	Surface Water Management Plan	Prepare and implement a Surface Water Management Plan to address issues including: • culvert and bridge design • incorporation of best practise drainage design at the time of construction • erosion control • specific design measures including retardation systems • containment of spills of hazardous goods due to traffic accidents	To minimise and mitigate impacts on the environment by: • maintaining the existing surface hydrology characteristics within the project area • Preventing deleterious impact on water (surface and ground) quality from the Peel Deviation project • minimising erosion due to the proposal • preventing direct discharge of surface water runoff from the project to the environment • preventing spillage of hazardous goods to the adjacent environment	Pre-construction	DEP	CALM, WRC, PIMA	Surface Water Plan submitted for approval.

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
5	Wetlands	Avoid the loss of conservation value wetlands (apart from at the Serpentine River crossing) and minimise impacts on all other wetlands	To prevent the loss of high conservation value wetlands and minimise impacts on other wetlands due to road construction and operation.	Pre-construction and Construction	DEP and WRC	DEP and WRC	Surface Water Management Plan Performance and Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
6	Vegetation Management Plan	Prepare and implement a Vegetation Management Plan to address issues including: • clearing of vegetation within the road reserve • a review of Declared rare and Priority flora prior to construction	To minimise and mitigate impacts on the environment by: • minimising the area of vegetation cleared during construction to the minimum required for road construction and congruent with Austroads standards • ensuring impacts on Declared Rare and Priority Flora (as listed at the time of construction) are adequately identified and minimised during construction	Pre-construction and construction	DEP	CALM	Vegetation Management Plan submitted for approval. Performance and Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
7	Vegetation	Clearing and re-use of cleared vegetation shall occur in accordance with the MRWA Environmental Management Manual and Roadside Floracare Manual (unpublished)	Minimise the clearing of remnant vegetation within the road reserve	Construction	DEP	CALM	Performance and Compliance Reports
8	Vegetation	Clearly identify and mark areas of vegetation to be cleared	To limit clearing of vegetation within the road reserve to the minimum required for road construction and congruent with Austroads standards	Construction	DEP	-	Performance and Compliance Reports
9	Dieback Management Plan	Prepare and implement a Dieback Management Plan	To prevent the spread of dieback due to road construction activities	Pre-construction and Construction	DEP	CALM	Dieback Management Plan submitted for approval. Performance and Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
10	Rehabilitation and Landscape Plan	Prepare and implement a Rehabilitation and Landscape Plan to address issues including: • weed management • revegetation strategies • visual amenity	To minimise and mitigate impacts on the environment by: • preventing the introduction and spread of weeds • using indigenous native vegetation species consistent with adjacent communities • ensuring visual amenity of the area adjacent to the project is not unduly affected by the proposal • revegetating previously cleared farmland within the road reserve	Pre-construction	DEP	CALM, PIMA	Rehabilitation and Landscape Plan submitted for approval. Performance and Compliance Reports-

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
11	Fauna Management Plan	Prepare and implement a Fauna Management Plan to address issues including: • a review of CALM's protected fauna lists prior to construction • identify and implement appropriate fauna management techniques in areas of remnant vegetation • fauna migration pathways	To minimise and mitigate impacts on the environment by: • ensuring impacts on protected fauna (as listed at the time of construction) are adequately identified and minimised during construction • minimising disturbance to terrestrial fauna • providing fauna migration pathways at Nambeelup Brook and State Forest areas	Pre-construction, construction and post construction	DEP	CALM	Fauna Management Plan submitted for approval. Performance and Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
12	Foreshore Management Plan	Prepare and implement Foreshore Management Plan to address the issues of clearing, erosion control and scour at Serpentine, Murray and Harvey River crossings	To minimise and mitigate impacts on the environment at river crossings	Pre-construction and construction	DEP	WRC PIMA	Foreshore Management Plan submitted for approval Performance and Compliance Reports
13	Construction Management Plan	Prepare and implement a Construction Management Plan to address issues including: • dust • noise • vibration	To minimise and mitigate impacts on the environment by: • ensuring dust generated by the proposal does not create adverse social impacts • ensuring that noise complies with the Environmental Protection (Noise) Regulations1997 • ensuring that vibration complies with industry best practise	Pre-construction and Construction	DEP		Construction Plan submitted for approval. Performance and Compliance Reports

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
14	Public Access	Provide access to internal State Forest roads as requested by CALM	To manage access to State Forest	Pre-construction and Construction	CALM	CALM	Performance and Compliance Reports
15	Risk and Hazard – traffic accidents	Road accident statistics for the Peel Deviation will be maintained by Main Roads	Maintain road accident data for the Peel Deviation	Post –Construction	Main Roads	-	Main Roads
16	Risk and hazard – road condition	Monitor road safety, and monitor and maintain pavement conditions, drainage facilities and road signs consistent with standard practise	Monitor road safety and monitor and maintain the road pavement and associated structures	Post - construction	Main Roads	-	Main Roads
17	Aboriginal Heritage	Obtain clearance under the Aboriginal Heritage Act to disturb any Aboriginal sites impacted by the Peel Deviation	To avoid disturbance of Aboriginal Heritage sites where possible and comply with the requirements of the Aboriginal Heritage Act	Pre-construction	Minister for Aboriginal Affairs	Aboriginal Affairs Department	Aboriginal Affairs Department
18	European heritage	A method of maintaining the 10th Light Horse Bridle Trail shall be determined prior to construction commencing	The 10th light Horse Bridle Trail shall be maintained	Pre-construction	Shires of Murray and Waroona		Shires of Murray and Waroona

No.	Topic	ACTION	Objectives	Timing	To requirements of:	Advice	Measurement/ Compliance Criteria
19	Land acquisition - hardship	If requested by the owners of severed properties or small holdings, Main Roads shall consider the purchase of part or all of the holding	Avoid causing hardship to impacted landowners	Pre-construction	Main Roads	-	Main Roads
20	Land acquisition – equity	Land required for the Peel deviation road reserve shall be acquired in accordance with the Public Works Act 1902	To ensure equity in acquisition of required land	Pre-construction	Main Road	-	Main Roads
21	Access and Severance – Local roads	The road construction program shall be managed by Main Roads to maintain access to existing local roads.	Access to local roads shall be maintained during the construction of the Peel Deviation	Construction	Main Roads	Local Authorities	Local Authorities
22	Access and severance – land use	Provide appropriate means for stock and machinery movement between severed portions of properties	To maintain existing land use patterns	Pre-construction	Main Roads	Landowners	Main Roads