

Abernethy Road – Tonkin Highway On – ramp

Main Roads Western Australia

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

**Environmental Protection Authority
Perth, Western Australia
Bulletin 1119
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Environmental Impact Assessment Process Timelines

Date	Progress stages	Time
8 July 2002	Level of Assessment set (no appeals)	
5 May 2003	Proponent Document Released for Public Comment	10 months
2 June 2003	Public Comment Period Closed	4 weeks
11 September	Final Proponent response to the issues raised	15 weeks
3 November	EPA report to the Minister for the Environment	

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Summary and recommendations

Main Roads Western Australia (MRWA), propose to construct an On-ramp from Abernethy Road to Tonkin Highway, Kewdale. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations as required by Section 44 of the *Environmental Protection Act 1986* to the Minister for the Environment, on the environmental factors relevant to the proposal.

Relevant environmental factors

The EPA decided that the following environmental factors relevant to the proposal required detailed evaluation in the report:

- regionally significant vegetation (Bush Forever site 386); and
- wetlands.

There were a number of other factors that were very relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

Conclusion

The EPA has considered the proposal by MRWA to construct the proposed Abernethy Road – Tonkin Highway On ramp and associated stormwater detention basin.

The EPA notes that the proposal will result in the clearing of approximately 1 ha of vegetation. The majority of this clearing (0.75 ha) occurs in a Conservation category wetland (CCW) that forms part of a larger area of vegetation that is of regional, State and National significance having been identified in *Bush Forever* (Government of WA, 2000) and on the Register of National Estate (AHC, 2003).

The wetland to be impacted is known to be of very high conservation significance and was first identified in Hill et al. *Wetlands of The Swan Coastal Plain* (WRC, 1996) and is referred to hereafter as the Abernethy Road wetland. Volume 2b of this series (*The Wetland Atlas*), includes a ranking system which was designed to provide a comparative framework to illustrate the relative significance of wetlands. Wetlands were ranked by number and area with the top ranked wetland of any type given a rank of 100%. Using this framework, the Abernethy Road wetland was given a rank of 99% and 100% respectively highlighting its significance in relation to all other wetlands of the same type, on the Swan Coastal Plain.

This wetland is one of two wetland areas within the suite-type group (Mungala) that is considered a priority for conservation due to their ecological significance and degree of naturalness. Importantly, the larger size of this wetland is a key value in terms of the reasons for the wetland being regarded as of high significance. A reduction in the size of this wetland is not supported.

When the clearing of 0.75 ha of this wetland is examined, the proposal will result in a maximum loss of 7% of *Pericalymma ellipticum* Shrubland and 8% *Melaleuca raphiophylla* Woodland, wetland dependant vegetation. Although this represents a maximum loss because the Project Area (19 ha) examined by the proponent in its detailed vegetation surveys did not encompass the entire Abernethy Road wetland (23

ha), the reduction in percentage of wetland dependant vegetation were the entire CCW to be examined, is not expected to be considerably less, such that this impact could be considered acceptable.

Within the context of the larger Bush Forever site the proposal impacts on vegetation of Southern River Complex – Central and South in Excellent to Very Good condition (using the *Bush Forever* condition rating scale). The Southern River Complex – Central and South is identified as having 19.8% of the original extent of this vegetation type remaining. However, only 1.5% of this is currently identified for protection in secure conservation reserves (EPA, 2003). Therefore the impact of this proposal on a Bush Forever area that contributes to the target of 10% representation of this vegetation type as defined in *Bush Forever*, cannot be regarded as insignificant.

The proponent has proposed a mitigation strategy which includes the protection of an area currently identified in *Bush Forever*. The EPA is of the view that protection of a Bush Forever site does not constitute a mitigation strategy for a proposal that impacts on another Bush Forever site.

The EPA is aware that development on Perth Airport land is subject to Commonwealth processes and outside the jurisdiction of the *Environmental Protection Act 1986*. However, the State's *Bush Forever* policy recognises the Airport land as containing regionally significant vegetation. The EPA has also provided Other Advice in section 5 which outlines the EPA's understanding of development of Perth Airport and its impact on the Bush Forever site.

Overall, the impacts associated with the proposal would erode and devalue the conservation category wetland which contributes significantly to the value and viability of the larger Bush Forever site. The EPA has therefore concluded that the proposal cannot be managed to meet the EPA's objectives in relation to wetlands and regionally significant vegetation.

Recommendations

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

1. That the Minister considers the report on the relevant environmental factors of
 - regionally significant vegetation; and
 - wetlands,as set out in Section 3.
2. That the Minister notes that the EPA has concluded that the proposal cannot meet the EPA's environmental objectives for regionally significant vegetation and wetlands and is therefore environmentally unacceptable and should not proceed.
3. That the Minister notes that the EPA has not included in this Bulletin "conditions and procedures to which the proposal should be subject, if implemented" because the EPA holds the view that the proposal should not be implemented.
4. That the Minister not issue a statement that the proposal may be implemented.
5. That the Minister notes the EPA's Other Advice presented in Section 5 regarding the impacts of the development of Airport land in relation to *Bush Forever*.

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1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by Main Roads Western Australia (MRWA) to construct an On-ramp from Abernethy Road to Tonkin Highway, Kewdale. The proposal includes the construction of the On-ramp, and an associated stormwater detention basin within the loop created by the On-ramp.

The EPA was first advised of the proposal for the construction of the On-ramp in January 1999. As the land required for the project was owned by both the State and the Commonwealth, the EPA advised that State assessment processes may not fully apply. At this time, MRWA were also alerted to the number of significant environmental features of the site that were likely to be considered by the EPA, should the proposal be referred for assessment.

The proposed On-ramp was formally referred to the EPA in June 2002 after MRWA began the process to transfer the land from the Commonwealth to the State. The level of assessment was set at Public Environmental Review (PER) on 8 July 2002 and the PER was released for a period of 4 weeks public review public review from 5 May to 2 June 2003.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the environmental factors relevant to the proposal. Section 4 discusses the proponent's commitments and recommended conditions. Section 5 provides Other Advice by the EPA, Section 6 presents the EPA's conclusions and Section 7, the EPA's Recommendations.

Appendix 5 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

2. The proposal

The proposed Abernethy Road – Tonkin Highway On-ramp site is located on Westralia Airports Corporation (WAC) land, within Bush Forever site 386, *Perth Airport and adjacent Bushland*, Kewdale (see Figure 1). MRWA have advised that the purpose of the On-ramp is to provide direct access between the Forrestfield, Kewdale and Wattle Grove industrial areas and the Primary road network including Roe and Tonkin Highways. MRWA propose that the On-ramp would provide for safer and improved access to the regional road network for industrial, commercial and commuter traffic.

The implementation of the project would require approximately 2.3 ha of land. Of this, 0.9 ha is cleared with the remaining 1.4 ha currently supporting native vegetation. The proposal would involve vegetation clearing, preliminary site

earthworks, the construction of the On-ramp and the implementation of drainage treatments and controls (stormwater detention basin).

As part of its proposal, MRWA intend to transfer the ownership of Lot 109 Clifford St, Orange Grove to a suitable agency to be managed for conservation purposes in order to mitigate for the environmental impacts associated with the construction of the On-ramp.

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in Section 2.0 of the PER, (Biota, 2003).

Table 1: Summary of key proposal characteristics

Element	Description
Construction duration	4 months
Operation life of proposal	Ongoing (30 years plus)
Area of disturbance	2.3 ha (1.4 ha vegetated, 0.9 ha already cleared, see Figure 1)
Components	<ul style="list-style-type: none"> • On-ramp to Tonkin Highway • Drainage treatments and detention basin
Traffic volume	~5,700 vehicle movements per day by 2021
Environmental mitigation	Acquisition of bushland area for conservation purposes

Since the release of the PER and in response to matters raised in submissions, a number of modifications to the proposal were made by the proponent. These include:

- a reduction in the clearing required from 1.4 ha to 1 ha;
- management for Priority species (*Verticordia lindleyi* subsp. *Lindleyi*) to be developed in consultation with the Department for Conservation and Land Management (DCLM);
- a commitment to preparing a suitable environmental mitigation strategy in consultation with the DCLM, Water and Rivers Commission (WRC), the Bush Forever Office at the Department for Planning and Infrastructure (DPI) and the Department of Environment (DoE) prior to initiating construction works; and
- a hydrocarbon contaminant spill plan to be prepared as part of the projects Environmental Management Plan.

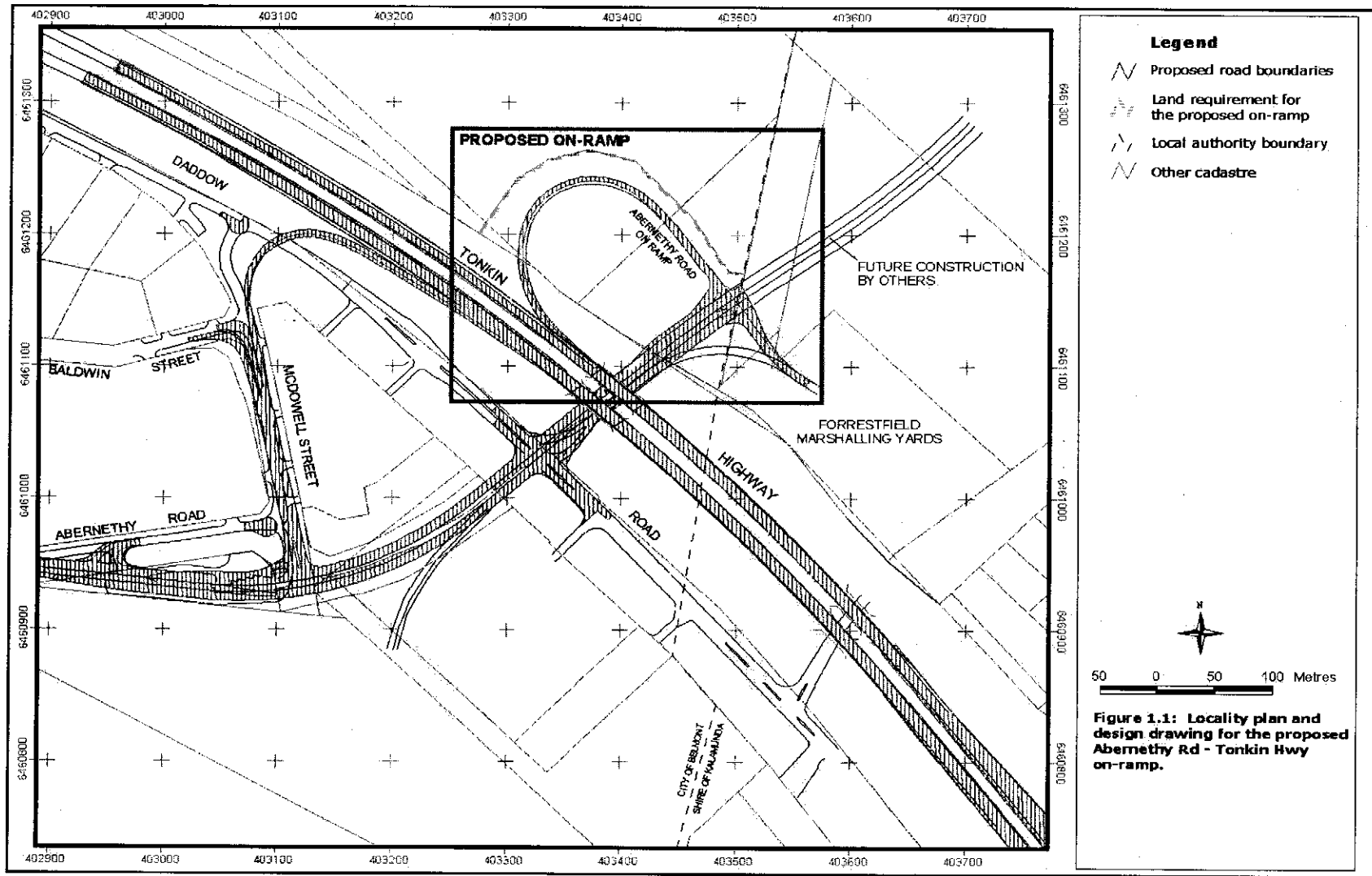


Figure 1: Proposed Abernethy Road-Tonkin Highway On-ramp

3. 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.

It is the EPA's opinion that the following environmental factors relevant to the proposal require detailed evaluation in this report:

- regionally significant vegetation (Bush Forever site 386); and
- wetlands.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received, in conjunction with the proposal characteristics.

A number of other matters were considered to be of relevance to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation of these factors.

Details on the relevant environmental factors and their assessment are contained in Sections 3.1 and 3.2. The description of each factor shows why it is relevant to the proposal and how it would be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the EPA's environmental objective set for that factor.

3.1 Regionally significant vegetation (Bush Forever site 386)

Bush Forever is the primary mechanism for implementing the Governments commitment to conserve regionally significant bushland in Perth. *Bush Forever* has a target of securing at least 10% of each of the original 26 vegetation complexes of the Swan Coastal Plain portion of the Perth Metropolitan Region to achieve this (Government of WA, 2000).

As the proposal affects an area located within the Perth Airport *Bush Forever* site 386, impacts need to be considered within the context of impacts on the values of the *Bush Forever* site. This site, which has a total area of approximately 629 hectares, is identified in a number of regional, State and Commonwealth studies that have established and documented its significance, including:

- *Bush Forever* (Govt. WA, 2000);
- Register of National Estate "Forrestfield Bushland Perth Airport WA" (www.ahc.gov.au); and
- Perth Airport Masterplan "Conservation Precinct No. 5" (Bechtel, Sinclair Knight Merz, 1999).

In particular, the identification of the site by the Western Australian Government in *Bush Forever* verifies its status as an area of regionally significant bushland. The description of the site within the *Bush Forever* document, notes the following significant environmental features:

- Declared Rare Flora (DRF) and Priority Flora;
- Priority and regionally significant vertebrate fauna;
- significant invertebrate fauna (including species never before recorded on the Swan Coastal Plain);
- Threatened Ecological Communities (TECs);
- Conservation Category wetlands (CCWs); and
- regionally significant vegetation of the Southern River Complex – Central and South, evaluated using the Bush Forever condition rating as being in Excellent to Very Good condition.

However, as discussed further in Other Advice, the proposed development of Perth Airport land is not subject to State approvals processes. Should the Perth Airport Masterplan be implemented as proposed, approximately half the area recommended by *Bush Forever* would be reserved for conservation.

Register of National Estate

The importance of this Bush Forever site is further reinforced by the sites inclusion on the Australian Heritage Commissions Register of National Estate (www.ahc.gov.au). In summary, the 'Statement of Significance' for the Register notes that the larger site "Forrestfield Bushland, Perth Airport" is one of the relatively few areas on the Swan Coastal Plain where wetlands, damplands, heathlands and woodlands are linked and sustain uncommon natural processes. It is further stated that the size and condition of the place contributes to its importance for landscape and habitat protection. The National Estate area contains vegetation in the best condition within the airport site, described as being within the top five percent of sites with respect to ecological condition by the then WA Ministry for Planning and in the airports least disturbed category (www.ahc.gov.au).

Description

Flora and vegetation

The vegetation to be impacted by the proposal is representative of the Southern River Complex - Central and South and has been evaluated using the Bush Forever condition rating scale as being in Excellent to Very Good condition. The proponent identified a Project Area for which detailed vegetation surveys were undertaken (see Figure 3). Details of the vegetation surveys undertaken are provided in Section 3 of the PER.

These surveys identified three plant communities that will be impacted by the proposal as follows:

- *Pericalymma ellipticum* var. *ellipticum* shrubland on sumpland (wetland dependent vegetation);
- *Melaleuca raphiophylla*/*M.preissiana* woodland over sedgelands (wetland dependent vegetation); and

- *Banksia attenuata/B.menziesii* woodland over mixed low shrublands on low sandy rises (upland vegetation).

While specific flora and vegetation surveys undertaken for the PER did not identify the TEC known as floristic community type 20a (*Banksia attenuata woodland over species rich dense shrublands*), the site characteristics of the area of bushland adjacent to the Project Area appear likely to support this community. Floristic Community 20a is listed as Endangered in WA. Its current distribution is described as limited, there are very few occurrences and each of these is small and/or isolated and extremely vulnerable to known threatening processes (www.calm.wa.gov.au).

The plant communities of the project area are also associated with the habitat of the following significant flora taxa:

- DRF, *Macarthuria keigheryi*;
- Priority 3, *Platysace ramosissima*; and
- Priority 4, *Verticordia lindleyi* subsp. *Lindleyi*.

Although the DRF species *M. keigheryi* was not identified in the studies completed for this assessment, as stated in the PER (Section 3.2.3 page 38) *M. keigheryi* is a cryptic species and it is possible that in spite of the targeted surveys that have been carried out, it may still be present in the project area (Biota, 2003).

Fauna

Due to the significant amount of faunal data that is available for the general project area and the small size of the area of faunal habitat to be affected the EPA determined that a detailed fauna survey was not required for the PER. However, the proponent's consultant undertook an assessment of the fauna habitats of the project area and reviewed available fauna records from similar habitats nearby to assess the likely significance of the project area for fauna. This assessment was then reviewed by the EPA Service Unit. The EPA considers that the PER adequately assessed the significance of the project area for fauna.

From the information available it is clear that the larger Perth Airport site, has a rich vertebrate and invertebrate faunal assemblage in comparison to other sites on the Swan Coastal Plain. This assemblage includes the only known population of the Crowned snake (*Elapognathus coronatus*) within the Perth area (How, 1995), species of spider (*Laestrygones*) never previously recorded from the Swan Coastal Plain (How *et al.* 1996) and the rare species of huntsman spider, *Zachria flavicoma* (How *et al.* 1996).

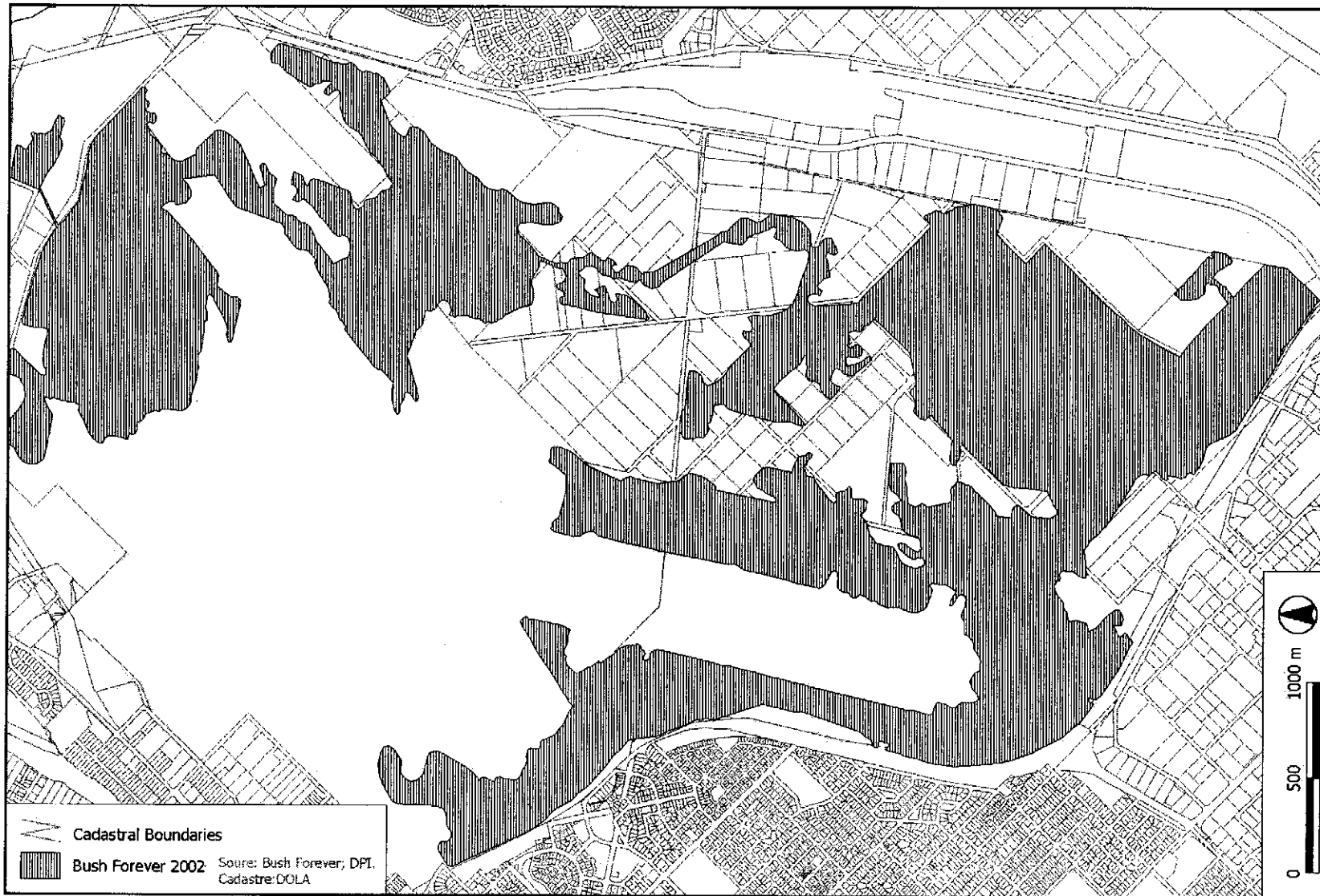


Figure 2(a): Bush Forever site Perth Airport and Adjacent Bushland

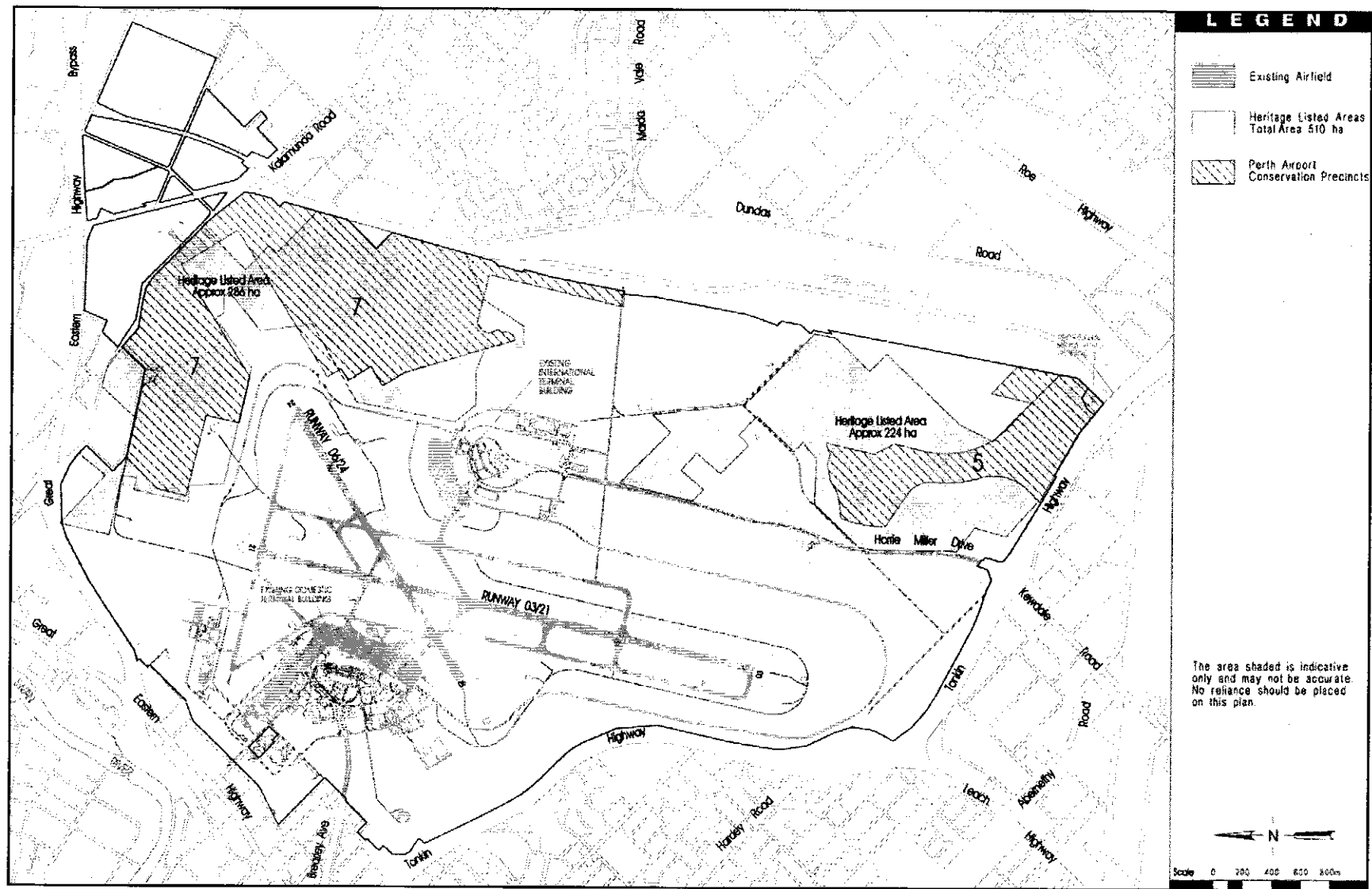


Figure 2 (b): Conservation Precinct (Perth Airport Masterplan) and Register of National Estate (Australian Heritage Commission)

The project area has previously been identified as potentially suitable for the translocation of the Western Swamp Tortoise (WST) in Kuchling and Burbidge's 1996 *Survey of the Western Swamp Tortoise and its habitat at the Perth Airport*, (report to the Federal Airports Corporation and the Australian Nature Conservation Agency).

However, DCLM has recently advised that this area was ranked relatively low in suitability for potential translocation of the WST. In comparison to other swamps on the airport land this site is not considered deep enough or large enough to support a viable population of the species. The WST Recovery Team has recommended that other areas on the airport land are considered more suitable as habitat for any proposed translocation project and they no longer have an interest in the area that includes the project site.

Impacts of the proposal

Construction of the On-ramp

The proposal would result in the clearing of approximately 1 ha of vegetation of Southern River Complex - Central and South vegetation (Govt. of WA, 2000). An additional 0.4 ha of upland vegetation would remain isolated within the loop of the On-ramp. The impacts of the proposal on the wetland's vegetation are discussed in more detail in Section 3.2.

At least two specimens of the Priority 4 species *Verticordia lindleyi* subsp. *lindleyi* are located within the area proposed to be cleared for the On-ramp. Although the DRF species *M. keigheryi* and the Priority 3 species *Platysace ramosissima* are found in the vicinity of the proposed on-ramp, DCLM's records and the 4 targeted surveys do not show that either species is found within the proposed construction area. MRWA has provided a commitment to obtain additional information and undertake management activities to assist in the conservation of *Verticordia lindleyi* subsp. *Lindleyi*.

Potential additional clearing

The potential for additional clearing associated with the provision of firebreaks or access tracks around the On-ramp associated land was raised during the assessment process. While the most recent information received from WAC is that it does not foresee a need for fire access tracks or firebreaks along the abutment of the land required for the On-ramp and airport land, there is some potential in the future for further clearing to be required for this purpose which would be additional to that required for the On-ramp itself. The width of any fire access tracks is not fixed but may be up to 15 – 20 metres if access for large vehicles was required. The EPA has noted the potential for further clearing impacts and accepts that this lies outside the scope of this assessment. However, careful consideration will need to be given by WAC to the requirement and location of any future fire access as part of any fire management strategy

Submissions

The issues raised in the submissions focussed on the loss of regionally significant vegetation evaluated as being in Excellent to Very Good condition and the unique features of this transition zone between the Bassendean Dunes and Pinjarra Plain. Submissions also noted the sites value as a known habitat for DRF and Priority Flora species and the potential for the On-ramp to reduce the habitat area available for both.

A number of submissions were also received regarding the proposed mitigation strategy and the areas to be set aside for conservation by MRWA, should the project receive approval and be implemented.

Assessment

The area considered as the appropriate context for assessment of this factor is Bush Forever site 386. 1 ha of the 629 ha Bush Forever Site would be directly impacted by the proposal. However, as noted previously, only half of this area is identified for protection in the Perth Airport Masterplan.

The EPA's environmental objective for this factor is to protect the environmental values of areas identified as having significant environmental attributes and to maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.

The proposed 1 ha of clearing to implement the Abernethy Road – Tonkin Highway On-ramp proposal would impact regionally significant vegetation within a Bush Forever site of regional, State and National significance.

From the information provided in *EPA Guidance for the Assessment of Environmental Factors No. 10 Level of assessment for proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of the System 1 Region* (EPA, 2003), the Southern River Complex – Central and South is identified as having 19.8% of the original extent of this vegetation type remaining.

However, only 1.5% of this is currently identified for protection in secure conservation reserves. Therefore the impact of this proposal on a Bush Forever area that contributes to the target of 10% representation of this vegetation type as defined in *Bush Forever*, cannot be regarded as insignificant.

With regard to the proposed mitigation strategy put forward by the proponent, advice received from the WRC, DCLM and Bush Forever Office at DPI identified that the Clifford Street Bushland exhibits a number of significant environmental values and warrants conservation. However, Clifford Street Bushland is already identified for protection in Bush Forever. The EPA is of the view that protection of a Bush Forever site does not constitute a mitigation strategy for a proposal that impacts on another Bush Forever site.

Summary

Having particular regard to the relatively small size of the area to be impacted by the proposal but taking into account:

- (a) the identification of this Bush Forever site as having regional, State and National significance;
- (b) the impact of the proposal on regionally significant vegetation of the Southern River Complex – Central and South in Excellent to Very Good condition and the small extent (1.5%) of this vegetation complex represented in secure conservation reserves; and
- (c) the implementation of this proposal would result in the loss of vegetation, which exhibits values consistent with those for which the larger Bush Forever site was identified and contributes significantly to the value and viability of the larger site, the loss of this vegetation is considered unacceptable.

3.2 Wetlands

Policy Context

EPA Preliminary Position Statement No. 4

EPA Preliminary Position Statement No.4 Environmental Protection of Wetlands Position Statement No. 4, (Page 5, Section 4) sets out the guiding principles used by the EPA to evaluate the impacts of the proposals on wetlands. In Preliminary Position Statement No.4, the EPA states that it will seek to:

- *protect the environmental values and functions of wetlands in Western Australia;*
- *protect, sustain and where possible restore the biological diversity of wetland habitats in Western Australia;*
- *protect the environmental quality of wetland ecosystems of Western Australia through sound management in accordance with the concept of "wise use", as described in the Ramsar Convention and ecologically sustainable development principles regardless of land use or activity; and*
- *have as a goal no net loss of wetland values and functions and to achieve this goal, strategies such as wetland banking should be pursued.*

Additionally, as set out in Preliminary Position Statement No. 4 (Page 8), in assessing the environmental acceptability of development proposals the EPA will employ the precautionary principle where the approach involves "*careful evaluation to avoid wherever practicable, serious or irreversible damage to the environment.*"

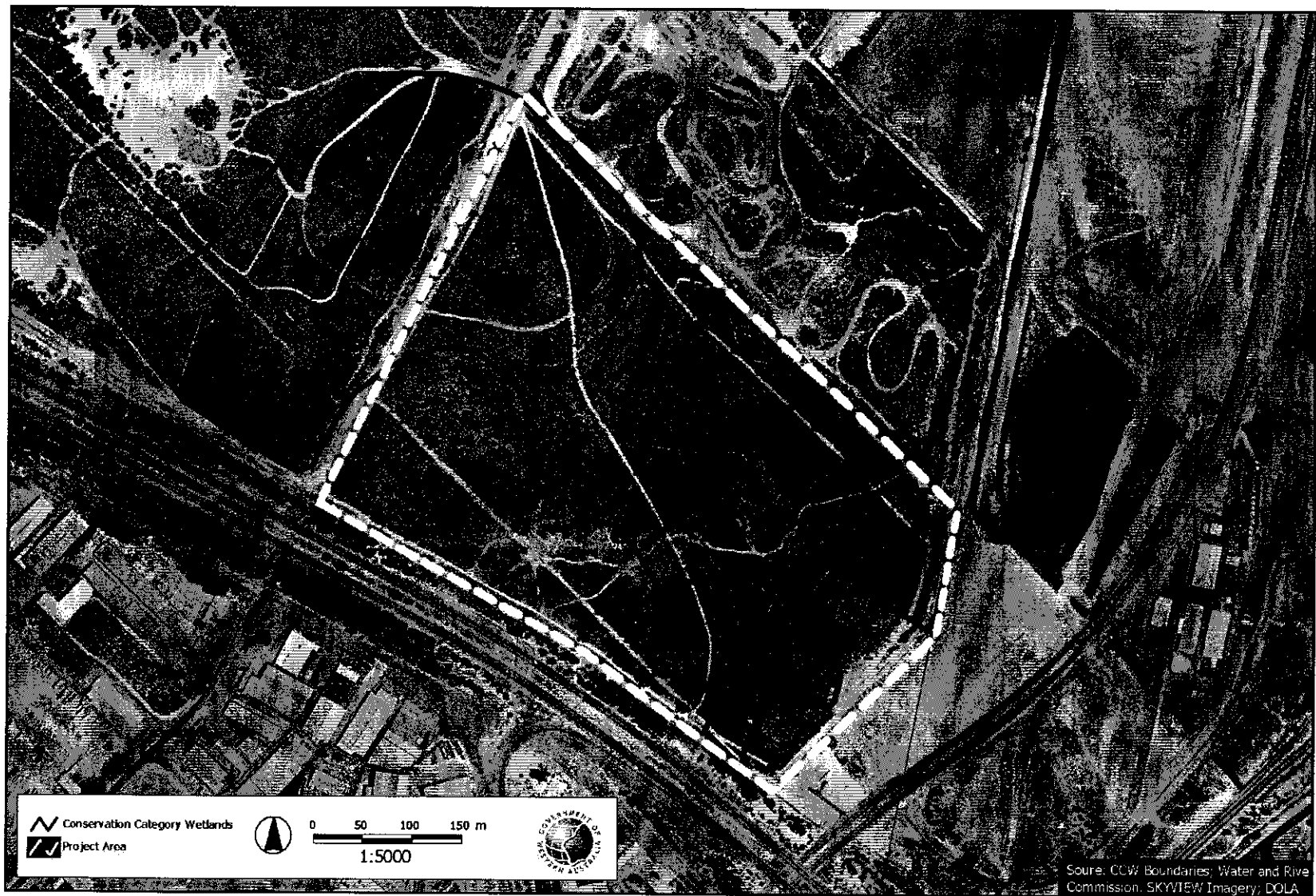


Figure 3: Abernethy Road Conservation Category Wetland Boundary and Project Area

Wetlands Conservation Policy for Western Australia

The Wetlands Conservation Policy for Western Australia (Govt. WA, 1997) establishes a commitment to a number of objectives including the prevention of further loss or degradation of valuable wetlands and wetland types and promote wetland conservation, creation and restoration.

The Wetland Coordinating Committee, which is responsible for the implementation of the Policy has identified that CCW's of the WRC Geomorphic Wetland Database (GWD), such as the Abernethy Road wetland, are 'valuable' as per the policy.

Water and Rivers Commission Position Statement

The WRC Position Statement on Wetlands (WRC, 2001) endorsed by the WRC Board states that CCW's are to be accorded the highest priority for conservation and that development upon these wetlands should not occur.

Description

Abernethy Road Wetland

The On-ramp proposal impacts on a conservation category wetland (CCW) identified as having high conservation values. This wetland, is identified as significant:

- in *Bush Forever*;
- on the Register of National Estate as part of the "Forrestfield Bushland, Perth Airport WA"; and
- as a CCW on the WRC Database.

The original construction design for the proposal required the clearing of 1.4 ha within Bush Forever site 386, of which 1 ha was identified as impacting the Abernethy Road CCW. However, in response to submissions received, the design has been modified and the area of proposed clearing is now 1 ha. Of this clearing, 0.75 ha is identified as within the Abernethy Road wetland. The reduction in area affected by the proposal is largely attributable to the proponent not removing vegetation that would be isolated within the On-ramp area.

The Abernethy Road CCW has a total area of approximately 23 ha and around 3% of the total area of the wetland would be cleared in the implementation of the proposal.

The PER defined a Project Area of 19ha in which to consider the proposal (see Figure 3). The following Table identifies the percentage of wetland dependant and upland vegetation to be cleared by the proposal.

Table 2: Proposed clearing in Abernethy Road Conservation Category Wetland

Vegetation type	Project area (ha)	Are to be cleared (ha)	%
<i>Pericalymma ellipticum</i> shrubland (wetland dependant vegetation)	7.9	0.55	7
<i>Melaleuca raphiophyllya</i> woodland (wetland dependant vegetation)	2.3	0.2	8
<i>Banksia attenuata</i> woodland (upland vegetation)	8.8	0.25	3

Source: Biota, 2003

Approximately 7% of the *Pericalymma ellipticum* Shrubland and 8% of the *Melaleuca raphiophylla* Woodland wetland dependent vegetation types found within the Abernethy Road wetland would be cleared.

However, it should be noted that because the Project Area of 19 ha does not encompass the whole of the CCW of 23 ha, it is likely that the percentage impacted, presented in the table above is at the upper end of expected impacts.

The Abernethy Road wetland was originally recognised as exhibiting high conservation values in *Wetlands of the Swan Coastal Plain* (Hill, Semeniuk, Semeniuk & Del Marco 1996). This publication provided a preliminary classification and ranking of value and conditions of wetlands into 'consanguineous suites' to provide a framework for identifying basic regional representativeness and basic wetland diversity. The WRC continue to work to verify and update the information provided by Hill *et al.* and have confirmed the Abernethy Road wetland as being of high quality and conservation significance.

Consanguineous suites are determined by identifying groups of wetlands which can be seen to be related through the factors of geomorphic setting, origin and water maintenance (Hill, 1996). Consanguineous suites also provide a regional classification system for wetlands that is useful for evaluating the representativeness of the conservation reserve system from the perspective of conservation of wetlands.

The Abernethy Road wetland is part of the Mungala consanguineous suite that is characterised in part by its location in the transition between the Bassendean Dunes and the Pinjarra Plain. 'Perth Airport surrounds' is one of 6 discrete locations which support the Mungala suite with other notable locations including Harvey and Lake Mungala.

The Wetland Atlas, Volume 2B of *Wetlands of the Swan Coastal Plain* (Hill *et al.*, 1996) presents the results of ranking of wetlands in the Mungala Suite-type according to relative value (from highest to lowest) using the first and second tier assessment methods described in Volume 2A. The value rankings for each wetland are then described in the Atlas according to 'percentiles based on:

- a) the proportion (by number) of wetlands of the suite-type that are less highly ranked (percentile ranking by number); and

- b) the proportion of total wetland area of the suite type that is less highly ranked than the subject wetland (percentile ranking by area).

For the Abernethy Road wetland, the key values identified in the first and second tier wetland evaluations are as follows:

- First Tier assessments:
 1. listing on the Register of the National Estate;
 2. listing on System Six (now *Bush Forever*); and
 3. outstanding wetland as recognised in other regional wetland studies.
- Second Tier Bulletin 374 (EPA, 1990), Assessment and Naturalness Assessments:
 1. natural Score of 39 using the EPA Bulletin evaluation method;
 2. percentile ranking by natural score of 98% by suite-type group; and
 3. 94% vegetated at the time of assessment.

The Wetland Atlas ranking system was designed to provide a comparative framework to illustrate the relative significance of wetlands within each consanguineous suite. The top ranked wetland in any given consanguineous suite type group would have a rank by number of 100% and a rank by area of 100%.

A wetland with a rank by number of 80% would be in the top 20% of wetlands in that suite type group. The ranking by area takes into account the total area of wetlands in the suite type group and so a wetland with a ranking by area of 80% would indicate that 20% of the wetland area in the group was placed before it (Hill *et al*, 1996).

The rankings for the Abernethy Road wetland are as follows:

- percentile ranking *by number* in suite-type group of 99; i.e. it is in the top 1% of wetlands in the suite-type; second only to Brixton Street wetlands.
- percentile ranking *by area* in the suite-type group of 100; i.e. it is the top ranked wetland in the suite-type group based on area.

The large size (and likely relatively high habitat value and long term viability) of the Abernethy Road wetland is a significant contributing factor to its status as a wetland of very high relative conservation significance in the context of the Mungala Suite type and the Bush Forever Study area. The EPA is also aware that the Mungala suite has been significantly impacted by development on the Swan Coastal Plain. Using a comparison between current CCW consanguineous suite mapping by the Water and Rivers Commission on the GWD and the mapping of wetlands, within the Wetland Atlas, it has recently been estimated that since 1996, approximately two thirds of CCW area within the Mungala suite, in the Bush Forever Study area, have been lost.

As a result of its high ranking, the Abernethy Road wetland is considered to be one of two wetland areas within the Mungala suite-type group considered a high priority for proactive management for conservation. The other highly ranked wetland within the suite, known as the Brixton Street wetland system, has been subject to a high level of management intervention effort by government agencies and the community.

Impacts of the proposal

As previously noted, the original construction design for the proposal required the clearing of 1.4 ha within Bush Forever site 386, however the design has been modified and the area of proposed clearing is now 1 ha. Of this clearing, 0.75 ha is identified as within the Abernethy Road wetland.

The potential impact of the proposal on the hydrological regime of the Abernethy Road wetland was the subject of an investigation by Aquaterra and included as an appendix to the PER. This investigation concluded that the construction of the On-ramp was unlikely to have any significant effects on either surface water or groundwater resources, or on the adjacent wetlands.

The WRC has advised that it concurs with the Aquaterra assessment. However, the Commission has expressed reservations about the proposed use of the On-ramp detention basin for sewerage overflow from the adjacent Water Corporation pumping station due to the potential risk of any leakage leading to eutrophication of the wetland.

Submissions

Issues raised in the submissions relating to wetlands primarily focussed on the:

- clearing of high quality conservation value wetland; and
- potential changes to the hydrological regime that may impact the remaining wetland area.

Assessment

The area considered for assessment of this factor is the 23 ha Conservation category Abernethy Road wetland, of which 0.75 ha is proposed for clearing.

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

Overall it is the EPA's view that the proposal cannot be regarded as meeting the objectives of the EPA *Preliminary Position Statement No.4*, the objectives of the *Wetlands Conservation Policy for Western Australia* or the *WRC Position Statement*, for the following reasons:

1. the proposal impacts on a wetland known to be of very high conservation significance and which is significant at regional, State and National levels, as documented in Bush Forever, the WRC Geomorphic Wetland Database and the Register of National Estate;
2. the affected wetland type (Mungala Suite-type) has been significantly depleted since 1996 and is poorly conserved;

3. although representing a maximum, the percentage of wetland dependant vegetation affected by the proposal at 7% of *Pericalymma ellipticum* shrubland and 8% of *Melaleuca raphiophyllya* woodland is regarded as significant;
4. the proposal affects a wetland value (the size/area of the wetland) which is a key value in terms of the reasons for the wetland being regarded as of high significance. The reduction in the size of the wetland cannot be supported; and
5. the proposal, if implemented would significantly devalue the rest of the wetland by fragmenting and eroding it's values. The proposed impact area is considered to be an integral part of a functioning wetland.

Summary

Having particular regard to the:

- (a) impacts of the proposal on the key values of a wetland identified as being of high conservation significance at the regional, State and National levels; and
- (b) the inconsistency of the proposal with key policy statements relevant to conservation of wetlands in Western Australia,

it is the EPA's opinion that the proposal cannot meet the EPA's environmental objectives for wetlands.

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 sees fit.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do 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.

4.1 Recommended conditions

The EPA has not included in this Bulletin "conditions and procedures to which the proposal should be subject, if implemented" because the EPA holds the view that the proposal should not be implemented.

4.2 Proponent's commitments

The proponent's commitments as set in the PER and subsequently modified, are shown in Appendix 4.

5. Other Advice

A number of submissions received raised the issues of the Airport Masterplan process and the lack of certainty about the long term reservation of areas identified for conservation.

Perth Airport is Commonwealth Land and therefore lies outside the jurisdiction of the State *Environmental Protection Act 1986*. State statutory processes are excluded from the final decisions about the development of Perth Airport land and the recognition and protection of this site is also outside the ultimate control of the State. The following information is provided as a context of the EPA's understanding of development of the Perth Airport and its impact on the Bush Forever site.

Airport conservation

A number of submissions raised concerns over the reference to the remainder of the project site [Precinct 5, see Figure 2(b)] as protected through its identification for 'conservation' in the Perth Airport Masterplan. Although the entire area of this Bush Forever site is identified as 629.5 ha (Government of WA, 2000), 50% of this is intended for future development within the Perth Airport Masterplan. Should the Perth Airport Masterplan be implemented as proposed, the area remaining that would contain significant environmental features is understood to be approximately 312 ha (PA, 2003 www.perthairport.net.au). In addition, the recently released *Perth Airport Preliminary Draft Environmental Strategy 2002/2003* identifies that of the approximately 700 ha of natural vegetation currently within Perth Airport, only 140 ha has been identified as Priority 1 (a high priority for conservation) and of this, less than 120 ha is proposed to be conserved. In summary, of the approximately 315 ha proposed for conservation (already half of that identified as regionally significant in *Bush Forever*), more than half would contain less than the highest priority areas.

The designation of the proposal impact area as a Priority 1 Conservation Area does not actually afford the site any long-term protection. The Masterplan states an intention to retain as much remnant vegetation as possible for conservation but no formal mechanism is proposed within the plan to achieve this.

In addition, the issue regarding public consultation on the Masterplan was raised. While the final document identified the potential for the On-ramp, the Preliminary Draft that was made available for public comment, did not. Government agencies and members of the public were not therefore, afforded the opportunity to comment on the proposal at the time of submissions for the Masterplan. While this matter may lie outside the scope of this assessment, it is considered relevant to the conclusion within the PER regarding extensive public consultation on the proposal and the protection of the remaining vegetation. The PER indicates that government agencies and members of the public have been provided with a previous opportunity to comment on the proposal for the On-ramp and the proposed on site conservation measures.

As noted in section 3.1, WAC cannot guarantee that additional clearing within the wetland for fire access purposes will not be required, should the On-ramp be approved and implemented. WAC have advised the proponent that it is pursuing an in principle perimeter patrol track along the airport boundaries and in particular, the conservation zones. The intention is to have the tracks reinforced with an appropriate material to

ensure their stability given the sandy nature of the soils. While the width of the tracks is not yet specified, the design criteria is likely to be consistent with the Aviation Rescue and Fire Fighting Services to accommodate 22 tonne vehicles on tracks approximately 15 – 20 metres wide.

It is the EPA's position that the issue of clearing for fire and emergency access must be carefully considered within the context of protecting the regionally significant vegetation and high quality conservation value wetland. The EPA considers that the need for the establishment of fire breaks should only occur as part of an overall strategy developed by WAC. The EPA would encourage the use of strategic fire breaks which avoid significant environmental features as a means of addressing this issue.

6. Conclusions

The EPA has considered the proposal by MRWA to construct the proposed Abernethy Road – Tonkin Highway On ramp and associated stormwater detention basin.

The EPA notes that the proposal will result in the clearing of approximately 1 ha of vegetation. The majority of this clearing (0.75 ha) occurs in a CCW that forms part of a larger area of vegetation that is of regional, State and National significance having been identified in *Bush Forever* (Government of WA, 2000) and on the Register of National Estate (AHC, 2003).

The wetland to be impacted is known to be of very high conservation significance and was first identified in Hill et al. *Wetlands of The Swan Coastal Plain* (WRC, 1996). Volume 2b of this series (*The Wetland Atlas*), includes a ranking system which was designed to provide a comparative framework to illustrate the relative significance of wetlands. Wetlands were ranked by number and area with the top ranked wetland of any type given a rank of 100%. Using this framework, the Abernethy Road wetland was given a rank of 99% and 100% respectively highlighting its significance in relation to all other wetlands of the same type, on the Swan Coastal Plain.

This wetland is one of two wetland areas within the suite-type group (Mungala) that is considered a priority for conservation due to their ecological significance and degree of naturalness. Importantly, the larger size of this wetland is a key value in terms of the reasons for the wetland being regarded as of high significance. A reduction in the size of this wetland is not supported.

When the clearing of 0.75 ha of this wetland is examined, the proposal will result in a maximum loss of 7% of *Pericalymma ellipticum* Shrubland and 8% *Melaleuca raphiophylla* Woodland, wetland dependant vegetation. Although this represents a maximum loss because the Project Area (19 ha) examined by the proponent in its detailed vegetation surveys did not encompass the entire Abernethy Road wetland (23 ha), the reduction in percentage of wetland dependant vegetation were the entire CCW to be examined, is not expected to be considerably less, such that this impact could be considered acceptable.

Within the context of the larger Bush Forever site the proposal impacts on vegetation of Southern River Complex – Central and South in Excellent to Very Good condition. The Southern River Complex – Central and South is identified as having 19.8% of the original extent of this vegetation type remaining. However, only 1.5% of this is currently identified for protection in secure conservation reserves (EPA, 2003). Therefore the impact of this proposal on a Bush Forever area that contributes to the target of 10% representation of this vegetation type as defined in *Bush Forever*, cannot be regarded as insignificant.

The proponent has proposed a mitigation strategy which includes the protection of an area currently identified in *Bush Forever*. The EPA is of the view that protection of a Bush Forever site does not constitute a mitigation strategy for a proposal that impacts on another Bush Forever site.

The EPA is aware that development on Perth Airport land is subject to Commonwealth processes and outside the jurisdiction of the *Environmental Protection Act 1986*. However, the State's *Bush Forever* policy recognises the Airport land as containing regionally significant vegetation. The EPA has also provided Other Advice in section 5 which outlines the EPA's understanding of development of Perth Airport and its impact on the Bush Forever site.

Overall, the impacts associated with the proposal would erode and devalue the conservation category wetland which contributes significantly to the value and viability of the larger Bush Forever site. The EPA has therefore concluded that the proposal cannot be managed to meet the EPA's objectives in relation to wetlands and regionally significant vegetation.

7. Recommendations

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

1. That the Minister considers the report on the relevant environmental factors of
 - a. regionally significant vegetation; and
 - b. wetlands,as set out in Section 3.
2. That the Minister notes that the EPA has concluded that the proposal cannot meet the EPA's environmental objectives for regionally significant vegetation and wetlands and is therefore environmentally unacceptable and should not proceed.
3. That the Minister notes that the EPA has not included in this Bulletin "conditions and procedures to which the proposal should be subject, if implemented" because the EPA holds the view that the proposal should not be implemented.
4. That the Minister not issue a statement that the proposal may be implemented.
5. That the Minister notes the EPA's Other Advice presented in Section 5 regarding the impacts of the development of Airport land in relation to *Bush Forever*.

Organisations:

Belmont Victoria Park Catchment Group
Conservation Council of Western Australia
Friends of Kensington Bushland
Friends of Perth Airport Bushland
Friends of Poison Gully Creek
Nature Reserves Preservation Group Inc.
Urban Bushland Council of Western Australia Inc.
Urban Hills Land Conservation District Committee
Waterbird Conservation Group
Wildflower Society of Western Australia Inc.

Individuals:

Angela Carr
Jeremy Dunnette
Kirsten Tullis
Margaret Owen
Nanette Schapel
Patrick Irwin
Regina Drummond
Rob Greenwood
Robin and Bernard Terry
Robyn King
Robyn McElroy
Russell Gorton
Shae Callan
Warwick Boardman

Government agencies:

Bush Forever Office at the Department for Planning and Infrastructure
City of Belmont
Department for Conservation and Land Management
Water and Rivers Commission

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- Environmental Protection Authority (1990). A guide to wetland management in Perth. Western Australia, EPA Bulletin 374.
- Government of Western Australia (1997). Wetlands Conservation Policy for Western Australia. Government of Western Australia, Perth.
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- Perth Airport (2003). Perth Airport Draft Environmental Strategy www.perthairport.net.au Perth Airport, WA.
- Water and Rivers Commission, (2001). Position Statement: Wetlands. WRC, Perth, Western Australia.

Appendix 3

Summary of identification of relevant environmental factors

Preliminary Environmental Factors	Proposal Characteristics and Potential Impact	Government Agency and Public Comments	Identification of Relevant Environmental Factors
BIOPHYSICAL			
Vegetation	Clearing of 1 ha of native vegetation of the Bassendean complex - Central and South. An additional 0.4 ha would remain isolated within the On-ramp loop.	<p>Submissions received expressed the view that the proposed clearing of regionally significant vegetation for this proposal was unacceptable. The vegetation is in:</p> <ul style="list-style-type: none"> • Excellent to Very Good condition • only 17% of the Southern River Complex remaining • a known habitat for significant flora and fauna • has particular value given its location on the transition between the Bassendean Dunes and Pinjarra Plains, and • has landform and visual amenity importance. <p>The clearing of vegetation was seen as a serious blow to the long term conservation value of the site.</p> <p>Concern was also expressed that rehabilitation or replanting efforts have a relatively poor success rate.</p>	This is a relevant factor and is discussed in Section 3.
Potential additional Clearing	Potential additional clearing required for fire breaks and access around On-ramp, estimated to be between 15-20 metres wide	<p>During the assessment process the proponent was asked to provide advice from WAC on their requirements for fire breaks or access after the construction of the On-ramp.</p> <p>Initially, WAC responded that fire access would be required and would need to provide for 22 tonne vehicles and be approximately 15 – 20 metres wide. However, further advice was sought and WAC responded that at this time, they do not see the need for such access along the eastern boundary, however no certainty can be provided.</p>	<p>The information provided by WAC is noted, however it provides no certainty as to the future potential for clearing should the On-ramp be constructed.</p> <p>The issue is discussed in Section 3.1.</p>

Preliminary Environmental Factors	Proposal Characteristics and Potential Impact	Government Agency and Public Comments	Identification of Relevant Environmental Factors
Flora	Clearing and disturbance of 1ha of known habitat for one Declared Rare and 2 Priority Flora species. An additional 0.4 ha would remain isolated within the On-ramp loop.	<p>Submissions expressed concern over the destruction of the known habitat for the DRF and Priority Flora species. While the four targeted surveys have not located any DRF populations within the impact area, the species is cryptic and the project area is identified as a known habitat.</p> <p>Submissions also expressed concern over the proposed relocation of the Priority 4 species and the response from DCLM advised that other management measures such as seed location may be more appropriate than relocation.</p>	<p>This is a relevant factor and is discussed in Section 3.</p>
Fauna	Clearing for the project would remove 1ha of habitat for a variety of significant terrestrial and aquatic fauna. An additional 0.4 ha would remain isolated within the On-ramp loop.	<p>It was suggested that the proposal could impact a variety of fauna including Southern Brown Bandicoots, reptiles, frogs, significant bird species and a variety of significant invertebrate species through habitat removal.</p> <p>A number of submissions raised the issue of the sites potential for the relocation of the Western Swamp Tortoise.</p>	<p>DoE and DCLM have advised that although the site contains a number of significant fauna species, the 1.4 ha of clearing proposed is unlikely to represent a significant threat to fauna, given the size of the remaining (Bush Forever) area.</p> <p>Information received from DCLM advises that the WST Recovery Team have no interest in this area of land for relocation</p> <p>The impacts of the proposal on fauna are discussed in Section 3.</p>

Preliminary Environmental Factors	Proposal Characteristics and Potential Impact	Government Agency and Public Comments	Identification of Relevant Environmental Factors
Wetlands	Clearing of 0.75 ha of wetland dependent vegetation and potential changes to hydrological regime.	Submissions highlighted the high quality and conservation significance of the wetland in a regional, State and National context. Concerns were expressed that the ecological and hydrological values of the entire wetland would be diminished directly through the implementation of the proposal and also through run off and spillages from the On-ramp.	The proposed loss of 0.75 ha of high quality conservation value wetland is considered to be a relevant environmental factor and is addressed in section 3 of this report.
Conservation Areas	The proposal would result in the clearing of 1 ha of native vegetation. An additional 0.4 ha would remain isolated within the On-ramp loop.	A number of submissions raised the issue that the proposed impact area is part of a larger area identified for conservation purposes: <ul style="list-style-type: none"> • as a CCW on WRC database; • in <i>Bush Forever</i>; • on the Register of National Estate; and • in the Airport Masterplan Conservation Precinct No. 5. Concerns were raised that any impact on this area would diminish the viability and reduce the values of the wider area that is recognised for conservation. A number of threatening process were identified as potentially increased by the on ramp such as the spread of disease, weeds and litter through increased traffic and fire.	This is a relevant environmental factor and is discussed in Section 3 of this report.
POLLUTION			
Water quality (ground and surface)	The implementation of the proposal would remove 0.75 ha of wetland and associated vegetation. An additional 0.4 ha would remain isolated within the On-ramp loop.	Submissions raised concerns that the proposed On-ramp would negatively impact the remaining wetland by: <ul style="list-style-type: none"> • reducing the area subject to inundation; • run off from the On-ramp embankments to the remaining wetland would contain foreign soil components; and • large machinery used in construction may leak oil and spill fuel into the remaining wetland. 	Review of the hydrological assessment indicates that there is unlikely to be any significant adverse impacts to the remaining wetland as this area to be impacted is at the bottom end of the local surface water catchment. The remaining wetland is therefore

Preliminary Environmental Factors	Proposal Characteristics and Potential Impact	Government Agency and Public Comments	Identification of Relevant Environmental Factors
		<p>A number of submissions also commented that the information contained within the hydrological assessment provided as an Appendix to the PER was lacking in detail</p> <p>For example:</p> <ul style="list-style-type: none"> • no data on seasonal water levels; • surface water level depths and extent were not mapped and related to rainfall figures; • groundwater levels not measured; and • assessment did not show how the proposal would alter the flows and distributions of water in the area. <p>Additional information provided to the EPA after the close of the submission period regarding drainage management identified that the proposed detention basin has been designed to allow for raw sewerage overflow from the adjacent Water Corporation pumping station.</p> <p>Comments have since been received from the WRC on this proposed use, highlighting concerns that this use may increase nutrient loads to the groundwater and remaining wetland.</p>	<p>unlikely to be impacted by a reduction in surface water flows.</p> <p>The potential use of the detention basin for raw sewerage overflow has not been considered as part of this assessment as MRWA have advised that this use is not necessarily required.</p> <p>In view of the above, this factor does not require further EPA evaluation.</p>
SOCIAL SURROUNDINGS			
Visual Amenity	The proposal will result in the clearing of approximately 1 ha, of which 0.75 ha is CCW. An additional 0.4 ha would remain isolated within the On-ramp loop.	A submission raised the issue that the construction of the On-ramp would adversely affect the visual amenity of the area.	<p>The proponent has responded to this issue in Appendix 5 Response to submissions.</p> <p>This factor does not require detailed EPA evaluation.</p>

Preliminary Environmental Factors	Proposal Characteristics and Potential Impact	Government Agency and Public Comments	Identification of Relevant Environmental Factors
OTHER			
Planning	The area required by the On-ramp is 2.3 ha. The On-ramp will provide access from Abernethy Road to Tonkin Highway.	<p>A number of submissions raised the issue of previous planning decisions that have constrained the area for the provision of the On-ramp, such as:</p> <ul style="list-style-type: none"> • the proximity of the Kewdale Road intersection with Tonkin Highway; • the Roe-Tonkin interchange; • the railway line; and • Dundas road. 	<p>The provision of the On-ramp and the limiting factors associated with the current road network are discussed Appendix 5 Response to submissions.</p> <p>This factor does not require further EPA evaluation.</p>
Airport Conservation	<p>The area required by the On-ramp is 2.3 ha, of this 0.9 ha is cleared and of the remaining 1.4 ha land required 0.4 is to remain isolated within the On-ramp loop.</p> <p>Of the 1 ha to be cleared, 0.75 is identified as wetland dependant vegetation.</p>	<p>A number of concerns were raised in the submissions regarding Airport Conservation, including</p> <ul style="list-style-type: none"> • no mention of the On-ramp in the Draft Airport Masterplan that was available for public comment; • WAC is fragmenting and degrading wetland and bushland areas; • lack of protection for wetland and vegetation in the airport site; and • vegetation within Conservation Precinct No. 5 is not necessarily protected. 	<p>The EPA has noted the concerns with respect to the insecurity of Airport land for conservation and this is addressed in Section 5 entitled 'Other Advice'.</p>
Mitigation Strategy	As part of the PER process, the proponent provided a mitigation/offset strategy for consideration should the proposal be approved.	<p>Among the submissions regarding the proposed mitigation strategy were concerns that one Bush Forever site is not an appropriate offset for the potential impact on another Bush Forever site.</p> <p>Comments received from DCLM, WRC and the Bush Forever Office at DPI all agreed that the proposed offset site had significant environmental values but was not a suitable offset for another Bush Forever site.</p>	<p>The EPA has addressed this issue in Section 3 Regionally significant vegetation.</p>

Appendix 4

Proponent's Consolidated Commitments

Table: Proponent commitments for the proposed Abernethy Road – Tonkin Highway on-ramp (Revised in response to submissions)

No.	Topic	Objective	Action	Timing	Advice from [†]
1	Environmental offset	To provide an appropriate offset for the removal of regionally significant vegetation and wetland area.	Develop and implement a strategy to address the loss of conservation values through the rehabilitation of a degraded area, or acquisition or securing of another area of similar ecological value for conservation purposes.	Process commenced pre-construction, with sign-off by relevant agencies prior to construction commencing. Transfers finalised during or within three months of the completion of construction.	DCLM, DEP, DPI, DOLA, WRC
2	Environmental Management Programme	<p>To minimise the impacts of construction works on the adjacent vegetation and fauna habitat remaining within Bush Forever Site 386.</p> <p>To ensure no impacts on nearby populations of Threatened Flora occur.</p>	<p>To prepare and implement an Environmental Management Programme (EMP) for the construction of the Abernethy Road – Tonkin Highway on-ramp. Components of the plan will include:</p> <ol style="list-style-type: none"> 1. vegetation clearing controls/significant tree identification 2. topsoil and landscaping plan 3. dieback and weed hygiene 4. environmental inductions 5. fire risk management 6. environmental auditing 7. drainage management 8. Hydrocabron spill plan 	Prepared and approved prior to construction. Implemented during construction. Audits completed during construction works and post-construction.	DEP, DCLM, WRC
3	Drainage Management	<p>To ensure that no road surface run-off directly enters the wetland.</p> <p>To ensure that there is provision for contaminant spillage entrapment.</p> <p>To ensure continued function in disposal of road run-off and infiltration</p>	<p>Construct the detention / infiltration basin as designed.</p> <p>Periodic monitoring of the infiltration basin post-construction to ensure continued function and maintain as required.</p>	Design finalised pre-construction, implemented during construction and post-construction.	DEP, WRC

Table: Proponent commitments for the proposed Abernethy Road – Tonkin Highway on-ramp (Revised in response to submissions)

No.	Topic	Objective	Action	Timing	Advice from [†]
		/recharge to the local aquifer.			
4	Priority Flora	To ensure that DCLM requirements are met regarding management measures for threatened flora species.	Liaise with DCLM to develop specific management measures for the local individuals of <i>Verticordia lindleyi</i> subsp. <i>lindleyi</i> .	Pre construction, with any DCLM required management actions.	DCLM
5	Acid Sulfate Soils	To ensure that adjacent wetland areas are not impacted by any acid drainage that may arise from sediments exposed during construction.	Implement assessment and management procedures in accordance with the Draft DEP Guidance Statement on ASS	Testing carried out prior to commencement of earthworks, any management procedures that may be required to be implemented during construction in accordance with the Draft DEP Guidance Statement on ASS	DEP
6	Aboriginal Heritage	To ensure that no sites of significance to Aboriginal people are impacted.	Prepare an Aboriginal Heritage Management Plan, to specify archaeological monitoring during construction activities.	Plan prepared prior to the commencement of construction and implemented during construction, with any statutory processes followed as per the requirements of the <i>Aboriginal Heritage Act 1972</i> .	DIA

[†] Advisory agencies: DEP – Department of Environmental Protection, DCLM – Department of Conservation and Land Management, DPI = Department of Planning and Infrastructure, DOLA = Department of Land Administration, WRC = Water and Rivers Commission, DIA = Department of Indigenous Affairs.

Appendix 5

Summary of Submissions and Proponent's Response to Submissions

17th July 2003

Ms. Rachael Mercy
EPA Service Unit
144 St Georges Terrace
Perth WA 6000

Dear Rachael

Summary of Proposal Revisions for the Abernethy Road – Tonkin Highway On-ramp PER

As requested, please find following a summary statement of recent project revisions for Main Roads' proposal to construct the Abernethy Road – Tonkin Highway on-ramp. Most of the modifications made in response to submissions have been relatively minor in nature, with Main Roads' progress on its commitment to develop an environmental offset the most substantial change since the PER. We have also attached a revised table of proponent commitments for this proposal (Table 1 of this letter) and a comparison table of the currently proposed environmental offset package with the environmental values to be affected by the proposal (along with a summary of the other potential offsets considered by the proponent) (Table 2).

Summary Statement of Proposal Revisions in Response to Submissions

The proponent has now considered all submissions received from relevant agencies, organisations and members of the public. The responses to these submissions have been submitted to the Environmental Protection Authority (EPA) and we provide a here a brief summary of the various minor amendments and additions to the proposal contained therein. These include:

- Specific focus on the inclusion of proteaceous species in rehabilitation works in response to comments on Carnaby's Cockatoo (in response to several submitters).
- Main Roads will attempt to avoid the removal of a 'significant' paperbark just north of the on-ramp if possible within design/safety constraints (item added to Environmental Management Programme (EMP) commitment in response to Friends of Perth Airport Bushland submission). Unfortunately more certainty cannot be provided as the location of this individual was not provided. Given that the trees within the on-ramp area do not match the tree in the photograph or the descriptions, it is highly unlikely this tree will be impacted upon by the on-ramp.
- Management for *Verticordia lindleyi* subsp. *lindleyi* to be developed in consultation with Department of Conservation and Land Management (DCLM) (in response to DCLM submission; commitment amended accordingly).
- Expansion of the environmental offset package to include Lots 109 and 110 Clifford St (in response to DCLM submission) and the revegetation of a corridor linkage between Bush Forever Site 386 and 319 (Dundas Road Bushland) (see discussion below and attached Table 2 for more detail).
- On-ramp will be constructed during the dry part of the year for structural purposes. This will also minimise run-off and sediment inputs to the wetland (in response to Friends of Perth Airport Bushland submission).
- Hydrocarbon contaminant spill plan to be prepared as part of the project EMP (commitment 2 amended accordingly in response to Friends of Perth Airport Bushland submission)
- Minor changes to wording, timing of implementation and advisory agencies for several commitments as requested by some agencies (see Table 1).

Revised Environmental Offset Package (Proponent Commitment 1)

Following the receipt of the submissions, the only major change to the proposal as presented in the PER is the offset package. We have now had discussions with relevant representatives of the DCLM and the Bush Forever Office in respect of the proposed offset package. As noted above, Main Roads has agreed to the expansion of the proposed offset package to also include Lot 110 Clifford Street as suggested by DCLM in the Department's submission. Furthermore, the package will now also include the revegetation of the eastern side of Tonkin Highway reserve to form a corridor linkage between Bush Forever Site 386 (Perth Airport Bushland) and Site 319 (Dundas Road Bushland) (see Figure 1 as attached).

In summary, the proposed offset package will now comprise of infill planting of the eastern verge of the Tonkin Highway reserve between Abernethy Road and Dundas Road and providing Lots 109 and 110 to the Conservation Estate. The details and benefits of this land transfer includes:

- The supply of 4.32 ha of regionally significant vegetation identified in Bush Forever and previously planned for road utility requirements, to the conservation estate (compared to the 1.4 ha of vegetation to be removed by the on-ramp). The offset site's vegetation is of the same complex level type as that to be affected by the on-ramp and is also situated on the transition zone between the Bassendean Dunes and Pinjarra Plain).
- Increasing the level of protection of a site containing Declared Rare Flora (DRF) (*Conospermum undulatum*), one Priority 3 species (*Lambertia multiflora* var. *darlingensis*) and two Threatened Ecological Communities (TECs) (Type 20b and 20c) by relinquishing it from Main Roads ownership to vesting in the Conservation Commission.
- Increasing the level of protection of a site containing a Conservation Category wetland (approximately 2.2 ha to be secured in the Clifford Street site compared with the 0.8 ha of Conservation Category wetland to be removed by the on-ramp), both of which are within the same locality and the same consanguineous suite.

A tabular comparison of the environmental values to be affected by the proposed on-ramp against those provided by the offset package is provided in the attached Table 2. A comparison with other options for offsets investigated by the proponent is also provided for your reference.

The proponent believes that the current offset package will offer a net conservation benefit outcome for the locality and fulfil the terms of commitment 1. The DCLM and the Bush Forever Office representatives consulted agreed verbally that the offset appeared appropriate and DCLM has indicated it would be willing to take over management responsibility for the Clifford Street land. Main Roads has written to the two agencies seeking confirmation of their endorsement of the offset approach (see attached correspondence). A meeting has also been scheduled with representatives from the Water and Rivers Commission for next week now that DCLM, as the future management agency, has indicated its willingness to accept the offset site.

I trust this provides you with the required information in preparation for the EPA briefing. Please contact me, or Paul West, should you have any further queries.

Yours faithfully,

Biota Environmental Sciences Pty Ltd

Garth Humphreys
Director

1.0 Justification for the proposal / Evaluation of options

Preamble

The Kewdale and Forrestfield industrial areas and railway yards constitute a strategically significant industrial and truck/rail intermodal centre for Perth and the State. Although this centre adjoins several major regional roads, access to and within the centre has been restricted in the past due mainly to the constraints imposed by the railway yards and tracks.

In the mid 1990s, decisions on the future use of railway land in Kewdale and Forrestfield created both a further need and an opportunity to review the regional road network for the area. The decision to rezone and dispose of surplus railway land in Forrestfield for industrial development and the decision to retain the Kewdale railway land for future expansion of the intermodal facilities emphasised the need for more efficient access between existing and proposed industries in the area and the regional road network. The disposal of the Forrestfield land also created an opportunity to provide this improved access by both removing obstructions (redundant rail tracks etc) to new road connections and providing land for them. Accordingly, in late 1997 a planning review recommended the construction of a new interchange on Tonkin Hwy at Abernethy Rd.

1.1 *'Grain should be transported using the railway line.'*

As noted above, the Grain Centre is not the only industrial operation in the area that would be served by the proposed on-ramp, it is just one of many. With respect to the transport of grain by rail, almost 90% of grain received in the metropolitan area arrives by rail and about 10% by road. The majority of the grain arriving by road goes directly to the Grain Centre in Forrestfield and is then transferred by rail to Kwinana before being loaded onto ships. The development of the Grain Centre in Forrestfield has removed the need for large numbers of grain trucks to travel through the metropolitan area and maintains rail as the dominant form of grain transport.

1.2 *'Seasonal – poor justification.'* *'Catering primarily for seasonal traffic.'*

As noted above, the on-ramp is not only designed to be used by seasonal traffic to the Grain Centre. It will provide direct access between the Forrestfield, Kewdale and Wattle Grove industrial areas and the Primary Road network (Roe and Tonkin Highways) for industrial, commercial and commuter traffic. BP Oil, Autotrans and Toll are just some examples of industries that generate significant volumes of traffic on a year-round basis that will directly benefit from the provision of the on-ramp. It is acknowledged that the PER makes reference to the seasonal nature of freight movements to the Grain Terminal. However in Section 2.3.1 of the PER there is reference to the broader traffic and access requirements that will be met by construction of the ramp and these are more than just seasonal.

- 1.3 *'The justification for the proposal has been couched in terms of the need for an on-ramp to improve access to the primary road network via Tonkin Highway. The proponent should comprehensively demonstrate to the EPA that an on-ramp is the only viable option for improving access to the primary road network from the grain terminal prior to offsets being considered'*
'Adequate access already via Roe Highway, Hale, Kewdale Road and Welshpool Road.'
'The Tonkin Highway has sufficient entry and exit points already.'
'Access from Grain Terminal via Abernethy Road via Kewdale Road.'

As noted above, access to and within the Kewdale and Forrestfield industrial areas has been restricted over a long period of time due to the barrier effect of rail facilities. A number of planning studies and reviews have looked at ways of reducing traffic congestion and making access more efficient but with little success to date. The issue is not the provision of additional regional roads as such but providing links between the existing regional roads and the adjacent industrial areas to make access as safe and efficient as possible.

Currently, traffic exiting the Kewdale and Forrestfield industrial areas, including trucks from the Grain Centre and the road/rail intermodal facility, utilise the Kewdale Road connection to Tonkin Highway. Kewdale Road, one of the principal distributor roads within the area, is heavily congested with direct access to numerous freight-based businesses and several traffic signal controlled intersections that operate on long cycle times. Kewdale Road traffic also mixes with traffic from the international airport terminal and in the future the relocated domestic terminal.

The current mix and volume of traffic using Kewdale Road is causing significant levels of congestion and delays within the Kewdale industrial area. This in turn impacts on the viability of the road/rail intermodal facility which is dependent on an efficient road network. The Government decision to retain and expand the intermodal facility was made to encourage greater use of the rail system for freight transport. While the intermodal facility will generally reduce the number of trucks on the road, there will be an increase in the number of trucks in the vicinity of the intermodal facility itself.

The provision of the on-ramp will provide a more direct connection to the regional road network for traffic exiting the intermodal facility, the Grain Centre and the new Forrestfield industrial area without the need for that traffic to mix with distribution traffic on Kewdale Road."

- 1.4 *'No explanation of how the ramp will improve safety and community amenity.'*

Improvements that make the road network more efficient lead to reduced levels of congestion, reduced driver frustration and reduced levels of road trauma. This principle is recognised by Austroads (previously NAASRA) in its publication Guide to Traffic Engineering Practice – Arterial Road Traffic Management when discussing Grade Separated Intersections & Interchanges. It makes the point that *"...on freeway type roads, access to the carriageways is limited to selected intersecting roads at which an interchange is constructed with specially designed ramps.... This provision in conjunction with other factors...largely contributes to the substantially better safety and operational performance of*

these roads.". Construction of the on-ramp will provide a more direct connection to the regional road network for traffic generated by the industrial areas and therefore reduce the number of freight vehicle movements using Kewdale Rd and the associated traffic signal controlled intersections. The provision of the on-ramp will also enable existing High Wide Load movements that are currently routed through residential areas of Forrestfield (Hale and Hawtin Rds) to be relocated away from these residential areas to more appropriate routes.

- 1.5 *'PER does not spell out why the on-ramp is required. Traffic movements should have been provided.'*
Current pattern of road use needs to be explained.'

Traffic that would be expected to use the on-ramp is currently using one of two existing routes out of the area. The first is via Abernethy Rd and Kewdale Rd to either Tonkin Hwy or Orrong Rd whilst the second is via Abernethy Rd, Daddow Rd and Chisholm Cr to Roe Hwy. The first of these requires traffic to use the intersection of Abernethy Rd/Kewdale Rd and the Kewdale Rd link to exit the area which contributes to the significant levels of congestion currently being experienced. In the case of traffic wishing to travel east on Tonkin Hwy it also means an additional travel distance of four kilometres over the on-ramp route. The second of the existing routes requires traffic to use the Daddow Rd rail crossing which causes significant delays due to the times the crossing is closed to allow shunting and through train movements. It also does not give access to the southbound carriageway of Roe Hwy and is not a viable route in the long term as the Chisholm Cr connection to Roe Hwy will be closed at some future stage.

- 1.6 *'Put ramp on other side of road where it has already been cleared.'*

The option of constructing the on-ramp on the south side of Abernethy Rd to avoid any land requirement from the Airport was considered but rejected on safety grounds. The ramp needs to get from ground level at Abernethy Rd to the existing elevated level of Tonkin Hwy at the southern railway bridge and be of a sufficiently gentle grade to allow ramp traffic to attain a speed that is nearing the speed of through traffic on Tonkin Hwy. The length of ramp required can not be accommodated in the land available on the southern side of Abernethy Rd and to build a ramp shorter than required would create a dangerous speed differential between through traffic and ramp traffic. The other problem with building the ramp on the south side of Abernethy Rd is that it would provide too short a weaving length between the point where the on-ramp traffic merges and the point where traffic exiting at the Roe Hwy off-ramp would have to diverge. Again this raises traffic safety concerns.

- 1.7 *'Oppose any needless, thoughtless or pointless destruction of our natural environment.'*
'No need to build the road.'

The Kewdale and Forrestfield industrial areas and railway yards constitute a strategically significant industrial and truck/rail intermodal centre for Perth and the State. Although this centre adjoins several major regional roads, access to and within the centre has been restricted in the past due mainly to the constraints imposed by the railway yards and tracks. Decisions regarding the retention and

development of the Kewdale marshalling yards and disposal of the Forrestfield marshalling yards has emphasised the need to improve access to Tonkin Hwy by the construction of ramps at Abernethy Rd and has also provided the means for it to happen by removing redundant rail tracks and providing additional land.

- 1.8 *'Alternative Route should be selected.'*
'Other options should be considered.'
'Consider another less convenient/more expensive option rather than clearing the land.'

As detailed in Section 2.3 of the PER, considerable effort has already been invested in considering other options to the on-ramp as now proposed. This included evaluation of environmental, social, engineering, cost and traffic safety criteria. This evaluation identified the proposed on-ramp as the best option from traffic safety considerations whilst minimising environmental impacts. It is worth noting that the submission from the Bush Forever Office of the Department of Planning and Infrastructure considered that the PER provided adequate justification for the on-ramp and the outcome of the evaluation of options. The Department of Conservation and Land Management (DCLM) submission was similar in this regard, stating *'Due to the nature of the proposal it appears that if approved there is no option but to clear 1.4 ha of remnant vegetation in this area.'*

As discussed in the PER, in addition to the alternative route options investigated, a significantly more expensive construction option (bridge uprights) was considered, however given that the area required to be cleared to cater for construction movements and clearances would be similar to that for the current proposal. The greatly increased cost (~\$5M) could therefore not be justified given that it would not result in any meaningful reduction in environmental impacts.

Considerable effort has been invested in minimising the land required for the on-ramp, both from an environmental and economic point of view. One of MRWA's main objectives in the design of the ramp was to reduce the land required as it was recognised that this would reduce costs for purchasing the land, improve the likelihood of receiving the necessary environmental approval, reduce the amount of land put forward in the complex land swap and improve the likelihood of the Commonwealth excising the land from the airport site.

Part of this process has only just been finalised, whereby Main Roads design engineers have managed to reach agreement with other stakeholders on a revised drainage basin design. This is shown below at Figure 1.



Figure 1: Revised drainage basin design for the proposed on-ramp.

The new basin results in reduced clearing requirements in respect of native vegetation, the conservation category wetland and Bush Forever Site 386. These improvements to the project are detailed in the appropriate responses in the following sections.

- 1.9 *'MRWA assumes the project will be approved and this is very unhelpful. The assessment process should have taken place at a point where the concept of constructing an on-ramp in the area was under consideration.'*

Acquisition of land from the Commonwealth has complicated the initiation of the formal environmental assessment for the project. DEP advice in 1998 indicated that referral could not be made until the land was acquired by the State. It is acknowledged that the DEP was prepared to consider the project referral in 2002 because it recognised the advanced state of the land acquisition process at that time. The provision of funding for a project by government in a works program assumes that the project will be constructed with all the necessary approvals received. Judgements are made to determine that environmental impacts can be managed at the concept development stage. Such was the situation in respect to this project and development of other aspects of the project has therefore occurred concurrently with the formal environmental assessment process.

- 1.10 *'Because of poor planning, a ramp is now required.'*
'On-ramp required because of poor planning.'

Good planning dictates that road network requirements are reviewed when significant decisions are made in respect of land use. This is what has happened in the development of the Abernethy/Tonkin interchange proposal. Government decisions regarding future use of the Forrestfield railway marshalling yard land and the retention and future expansion of the road/rail intermodal facility in Kewdale prompted a review of the road network in the Kewdale area. This review established the feasibility of constructing an interchange on Tonkin Hwy at Abernethy Rd. The planning process continued with a subsequent review of the then ultimate arrangement for the nearby Roe Hwy/Tonkin Hwy interchange to take account of the newly proposed Abernethy/Tonkin interchange. Changes to the ultimate Roe/Tonkin arrangement have been determined and a consequent amendment to the Metropolitan Region Scheme is being prepared.

- 1.11 *'Does not support the proposal on the grounds that the justification for choosing the proposed design is not sound.'*

The proponent has invested considerable effort in developing, evaluating and reviewing designs and construction methods as outlined in Section 2.0 of the PER (see also Response 1.8 above). It is Main Road's view that the design selected is sound and provides the best balance between road planning, traffic safety, design standards and impact minimisation possible. The proponent will, however, continue to review the design and construction of the proposed on-ramp, with a view to further reducing environmental impacts if practicable. An alternative structure could not be justified because of the cost and the amount of vegetation that would have still been cleared (see Response 1.8). Although the bridge deck would have somewhat reduced the amount of vegetation to be cleared because of no batters being required, the actual impact area would still have been similar given the requirement for construction access and movement. In addition to this, the deck would have to be wider to cater for the necessary safety barriers.

2.0 Fauna

- 2.1 *'Important and diverse fauna habitat.'*
'Good fauna habitat.'

The fact that the project area contains good condition and intact fauna habitat was detailed in the PER (p. 48-49, p65). The impacts on fauna associated with the proposal were also detailed in the PER (p. 67-71). It is in recognition of the importance of the fauna habitat and other ecological values that Main Roads has carried out planning studies to minimise the loss of fauna habitat, completed biological survey and impact assessment work, and is proposing an environmental offset package including the provision of a similar area of fauna habitat that is not currently within the conservation estate (see PER p. 79-80; Commitment 1). Main Roads also intends to carry out revegetation works within the eastern portion of the Tonkin Highway road reserve to provide for the creation and enhancement of a habitat corridor linkage between Bush Forever

sites 386 and 319 (Dundas Road Bushland) (see Response 6.5 below). This will be of value primarily to avifauna and may be utilised by smaller passerines, including species identified as significant on the Swan Coastal Plain (see Response 2.2; Section 3.2.2 of the PER).

2.2 *'Fauna found in site not common in other bushland or wetland remnants.'*

The known vertebrate fauna of the project area in fact mainly consists of the species that might be expected in larger bushland remnants in the Perth metropolitan region (Bush et al. 1995, How et al. 1996, Storr and Johnstone 1998). Some of the species that have been recorded are uncommon or otherwise of interest in the Perth area (such as the Crowned Snake *Elapognathus coronatus* as noted in the PER (p. 49) and several bird species regarded as 'Significant' on the coastal plain (p. 52)), however this is not the case for the majority of the fauna known from the land required for the on-ramp. The significance of the area is as much related to the intactness to the habitat and diversity of the fauna present in the area (as identified in the PER; p. 49-50) as it is to the uncommonness of any specific individual species present (see Response 2.1).

2.3 *'Project area impinges upon an area that contains free standing water every winter and spring and provides habitat for tortoises, frogs and other water-dependent fauna.'*

'Impact on fauna and would impact the whole wetland.'

'The on-ramp is based at the lowest point where the water pools and is likely to support water-based fauna.'

'No mention of water dwelling fauna.'

The on-ramp with the revised drainage basin design shown at Figure 1 of these responses, will impact 0.75 ha of the wetland area (less than 8% in total of wetland habitat in the project area) of which 0.2 ha is *Melaleuca* woodland and would hold standing water on a regular seasonal basis. This would leave over 2.0 ha (87%) of the extent of this 'core' deeper wetland area remaining in the adjacent conservation precinct. The hydrological assessment completed by Aquaterra (Aquaterra 2002; Appendix 6 of the PER) concluded that the proposed on-ramp would be at the 'bottom' of the local surface water drainage catchment and would therefore have little effect on the upgradient wetlands (including the area of free-standing water). As noted in the PER, some short-term and limited ponding of water may occur at the toe of the embankment (p.72), but this would not be expected to have a widespread impact on fauna utilising aquatic habitats in the immediate area. With the general lowering of groundwater levels in the Perth area, reduced rainfall against long-term averages and the possible drying of the wetland that is arising from this (p. 43 of the PER), it is possible that some localised ponding might even benefit fauna requiring standing water in future seasons.

The PER fauna section (Section 3.3) included accounts of frog and reptile utilisation of wetland habitats of the project area, water bird utilisation (including the potential use of road drainage detention basins), the value of the area for the Western Swamp Tortoise and utilisation of the paperbark woodland by 'Significant Bird Species of the Swan Coastal Plain'. The likely impacts of the proposed on-ramp on these wetland fauna were then provided in Section 4.0.

It is also possible that some native fish species (particularly Galaxiids) may utilise the deeper portions of the wetland, however it should be noted that the majority of this deeper habitat is outside of the on-ramp area and will not be directly impacted upon by the project as discussed above.

- 2.4 *'Haven for the Quenda and significant bird species.'*
'Bandicoot population is vulnerable in the airport bushland.'
'Fragmentation of the bushland at the airport will place the bandicoot under greater threat.'

The presence of *Isoodon obesulus fusciventer* in the project area was identified and discussed in the PER. The potential impacts on the population of this species present in the area were also evaluated. Whilst it was recognised that there are likely to be direct and indirect impacts on the population of this species in the area, these were considered to be limited, given that the on-ramp would clear an area equivalent to the home range of one individual (recognising that some overlap in ranges occurs in this species; Broughton and Dickman 1991). The proposal therefore appears unlikely to affect the conservation status of the species or to cause the loss of the local population. This is supported by the extent of contiguous and similar condition habitat intended to be set aside at the airport as part of the area identified as Conservation Precinct 5 by the final Perth Airport Master Plan (some 76 ha; Bechtel and Sinclair Knight Merz 1999) and the apparently widespread distribution of the species in the wider Bush Forever Site 386 (629.5 ha; Government of Western Australia 2000).

- 2.5 *'Western Swamp Tortoises still might be present'*
'PER did not refer to the Western Swamp Tortoise Survey report (1996).'

The Kuchling and Burbidge (1996) study referred to in the above submission did not identify the Western Swamp Tortoise as present in the on-ramp area and considered that sites SE1 and SE2 (the current proposal area) were *'too shallow for reliable use by this species'*. This finding was based on assessment and survey by the recognised experts on this species, and was used as the starting point for the approach to the potential value of the on-ramp site for this species. This finding was again confirmed by DCLM in its submission on this PER. The assessment of any other values the project area may have in respect of the Western Swamp Tortoise was based on consultation with the Department of Conservation and Land Management (DCLM). The results of this consultation were presented in the PER (Appendix 1), to the effect that the area was not under consideration for use by DCLM as part of the recovery plan for this species.

- 2.6 *'Fauna surveys should have been undertaken'*

As outlined on p. 20 and 48 of the PER, consultation with the Terrestrial Section of the DEP indicated that a comprehensive fauna survey was not required for this assessment. Page 48 of the PER provides the reasoning for this (principally that an assessment could be completed based on data from the previous survey work of the site completed by the WA Museum), and also notes that a targeted field survey for 'Significant Bird Species of the Swan Coastal Plain' was completed.

The survey work completed by the WA Museum included systematic sampling of both vertebrates and invertebrates within the project area for this proposal and therefore provided suitable data for this approach to be adequate for assessment purposes.

- 2.7 *'Fauna habitat value will diminish if one of the airports more reliable seasonal wetlands is lost.'*

It is acknowledged by Main Roads that some level of habitat value reduction will occur as a result of this proposal. The proponent considers however that the above submission is inaccurate. The analysis of the revised on-ramp design indicates that the wetland referred to would be reduced by 0.75 ha (or less than 8% of its current extent). It is likely that there will be other indirect impacts on the edge of the remaining wetland adjoining the on-ramp (as discussed in p.67, 72 of the PER), but even with these it seems unlikely that the wetland would be 'lost' in total as implied above.

- 2.8 *'Area should be considered for reintroduction of the Black-Gloved Wallaby.'*

Such a programme would need to be a joint initiative between the Westralian Airports Corporation (WAC) and the Department of Conservation and Land Management (DCLM), and would be outside of the management responsibility of the proponent. If an opportunity exists for such a reintroduction, it may still usefully be pursued in the habitat set aside by WAC within Conservation Precinct 5.

- 2.9 *'Chuditch could be found in the area.'*

This possibility was clearly recognised in the PER (p. 55), in addition to an assessment of recent local records and evaluation of the impact of potential habitat or home range loss in the event that Chuditch do periodically occur in the project area. This concluded that whilst there were no records of this species for the area in question, it was possible that it could periodically occur, but that the habitat loss would not be significant given the home range of the species (p. 55).

- 2.10 *'May contain undetected invertebrate fauna and should be protected.'*
'Reduce the habitat available to invertebrate fauna species that have a restricted distribution because of the extent, diversity and intactness of the habitat available.'

These submissions appear to reiterate the assessment already provided in Section 3.3.3 of the PER. It is worth noting however that the data available from the WA Museum surveys of the project area did not indicate that any of the invertebrate species known from the project area are currently listed as threatened or considered to be short-range endemics.

- 2.11 *'Construction will cause the death of many vertebrates, nests and burrows.'*

Direct loss of fauna through construction related mortality and indirect loss through displacement effects, were identified in the PER as a potential impacts of the proposal. It is difficult to quantify these impacts in terms of numbers of individuals, but it seems unlikely that it would be considered 'many' on the local context scale of likely vertebrate population sizes within Bush Forever Site 386.

2.12 'No reduction of *Banksia* woodlands to assist in the survival of Carnaby's Cockatoo.'

'The *Banksia* woodland makes up part of a larger habitat area for Carnaby's Cockatoo.'

The *Banksia* woodland to be removed as a result of the proposal is a very open association and comprises only a few mature trees. It would therefore be expected to have limited foraging value for Carnaby's Cockatoo and would be likely to supply only a small area of habitat even on the local scale. Denser and more structurally complex *Banksia* woodlands occur elsewhere in the project area (and in the wider extent of Conservation Precinct 5) and these would remain as the best local foraging resource for this species in the immediate area. Main Roads will also aim to utilise Proteaceous species in its local revegetation works, including the corridor linkage proposed along the Tonkin Highway reservation.

3.0 Flora and vegetation

3.1 'Strike at the heart of a magnificent paperbark wetland and destroy superb areas of adjacent dampland heath and *Banksia* woodland.'

The subjective values ascribed to the vegetation of the area expressed above are noted by the proponent, but they do not properly quantify the actual impacts on the vegetation types mentioned above. The clearing impacts on vegetation types were documented in the PER (Table 4.2 on p. 66), and presented in Table 1 below in a similar form for the revised design (see Figure 1 in Section 1.0 of these responses).

Table 1: Current approximate local occurrence of vegetation types in the project area, estimated areas post-construction and percentage impact (on the project area scale) arising from the proposed on-ramp.

Code	Vegetation Type	Current Area (ha)	Area to be removed (ha)	% of extent in project area to be cleared
1	<i>Pericalymma ellipticum</i> var. <i>ellipticum</i> shrubland	7.9	0.55	7%
2	<i>Melaleuca raphiophylla</i> woodland	2.3	0.2	8%
3	<i>Banksia attenuata</i> / <i>Banksia menziesii</i> Woodland over species rich shrubland	8.8	0.25	3%
4	Cleared/degraded remnant vegetation of woods	2.4	0.9	37%
5	<i>Adenanthos cygnorum</i> Shrubland	2.4	-	-
6	Open <i>Xanthorrhoea preissii</i> or <i>Hypocalymma angustifolium</i> Low Shrubland	1.5	-	-

The revised design for the proposal will now result in the clearing of 0.2 ha of the southern margin of the paperbark wetland referred to above (vegetation Type 2), 0.55 ha of adjacent heath (vegetation Type 1) and 0.6 ha of *Banksia* woodland (vegetation Type 3). This would leave 2.0 ha or 87% of the current extent of the paperbark wetland in the adjacent planned conservation precinct (see Figure 3.1 in the PER; p. 41). Similar proportions of the local extent of the *Pericalymma* heath and *Banksia* woodland vegetation types would remain after

the on-ramp was constructed (93% (7.35 ha) and 97% (8.55 ha) respectively). Vegetation clearing in total for the proposal is now reduced to just 1 ha. It is also worth reiterating that Main Roads has already been through a lengthy planning process to reduce these vegetation impacts, and that the current proposal would have significantly reduced clearing requirements over other options considered (see Section 2.3 of the PER and Section 1.0 of these responses).

- 3.2 *'Project will reduce the potential habitat of threatened flora species.'*
'Ramp will clearly reduce the habitat area available to threatened flora.'

The PER clearly documents the extent of survey work that has been conducted to assess the occurrence of threatened flora in the on-ramp clearing area (see p. 33, 37-38). No Declared Rare Flora (DRF) are known from the on-ramp land requirement area, with two individuals of a Priority 4 species the only individual flora records of higher conservation significance (p. 39 of the PER). The revised project design (Figure 1 of these Responses) will now require the clearing of only 1.0 ha of vegetation within a 629.5 ha Bush Forever site (0.2%) as documented in the PER, and it is acknowledged that some of this could represent potential habitat for threatened flora species. However it is the proponent's view that the assessment of impacts on threatened flora can only be based on actual species records in a case such as this where there have been repeated, seasonal surveys of a small area of vegetation.

- 3.3 *'Few remaining areas of intact remnant vegetation on the transition zone between the Bassendean Dunes and the Pinjarra Plain.'*

The status of the area as regionally significant on the basis of its dune system transition vegetation type was clearly recognised in the PER (see p. 10). It is in recognition of this status, and the removal of 1.0 ha of this significant vegetation, that Main Roads is investing effort in developing an offset package (Commitment 1; p. 81). The area currently under consideration (the Clifford Street bushland) contains another of the few areas of remnant vegetation on the transition zone referred to above.

- 3.4 *'Only 17% of the Southern River Complex remains and the Govt states 30% as the "threshold level" of the original extent of a vegetation type below which no further clearing should take place.'*

The proponent's understanding is that the criteria set for Bush Forever are considered the most appropriate for evaluation of the conservation status and threshold levels for vegetation complexes in the Perth metropolitan region. The Bush Forever study uses 10% of the original extent as the threshold representation criterion, with the Southern River Complex having 17% remaining as noted in this submission. This does not lessen the regional significance of the vegetation of Bush Forever Site 386 however, and the proponent intends to develop a suitable offset package to achieve a net environmental benefit in the locality.

- 3.5 *'Object to actions that undertake clearing given that they expend excessive resources in restoring environmental values.'*

As noted in Section 1.0 of these responses, Main Roads has already investigated other options that would eliminate the need to clear vegetation and these are not viable. Given that clearing cannot be avoided or reduced any further, it is the proponent's view that it is appropriate to expend suitable resources to provide for a net environmental benefit to the locality through conservation based offsets.

- 3.6 *'Nurseryman can only grow 33% of the plants on the SCP so there is no possibility of recreating this vegetation community.'*
'Waste of time replanting because of poor success levels.'

As this submission does not provide the citation for the study showing that only 33% of flora native to the Swan Coastal Plain can be cultivated, the proponent will regard this an unsubstantiated estimate. It is recognised that revegetation works can never recreate the same vegetation communities, but nursery cultivation of tubestock from local materials would only comprise part of any revegetation works in the area. Provenance seed collection and recruitment from topsoil and mulch would be expected to contribute other species that do not respond well to tube culture. Main Roads will develop a landscape and rehabilitation programme as part of their Environmental Management Plan for the project, and this will include the revegetation and enhancement of the Tonkin Highway road reserve to link Bush Forever site 386 with the Dundas Road bushland. This programme will also include supplementary assessments of recruitment success with infill planting, re-seeding and other follow-up measures to ensure adequate revegetation success occurs. With proper topsoil management, hygiene measures, species selection and follow-up monitoring and remedial works good revegetation results are possible, and the proponent does not consider such efforts a 'waste of time'.

- 3.7 *'Landscape or Landform should have been another factor to be considered.'*

The EPA determined that the relevant factors for this formal assessment were those outlined in Table 1.1 of the PER, and these did not include Landscape values. This factor is often included by the EPA when significant landscape and visual issues may be affected by the proposal (such as for road or other developments in National Parks, the construction of wind farms, etc). It was not considered a key factor for this proposal. The area to be impacted is generally very low relief in terms of landform, comprising an essentially flat sandplain over clay, with small-scale and localised sandy rises. There would appear to be no landform features within the area to be cleared that are not well represented in the balance of Bush Forever site 386.

- 3.8 *'Multiple sequences of woodland rises and wetland depressions are extremely valuable remnants in the broader context of the SCP.'*

The value of these remnants and their vegetation conservation significance was recognised in the PER which ascribed these features 'Regional Scale' conservation significance. As noted above (Response 3.4), it is in recognition of the significance of the area affected by the proposal that the proponent is developing an offset package of similar value.

- 3.9 *'To lose 8%, 8% and 7% of its Melaleuca, Pericalymma and Banksia associations, respectively, would be a serious blow to its long term conservation value.'*

Formal environmental assessments are frequently criticised for expressing loss of vegetation types in percentages (as this submission does) rather than stating quantitative values. With consideration of the revised project design (Figure 1 of these Responses), the real area terms for the above would be *'...0.2 ha, 0.55 ha and 0.25 ha of its Melaleuca, Pericalymma and Banksia associations, respectively...'* This would leave over 2.0 ha, 7.35 ha and 8.55 ha of the *Melaleuca, Pericalymma* and *Banksia* vegetation types respectively in the project area. The proportions referred to in this submission are also the relative loss of these vegetation types in the project area (which is the immediate area of the proposed on-ramp as defined on p. 23 of the PER), not the continuous bushland area identified as Conservation Precinct 5 in the Perth Airport Master Plan (see pp. 60-63; Bechtel and Sinclair Knight Merz 1999). On the scale of the area identified as Conservation Precinct 5 (approximately 76 ha compared to the 25 ha of the project area), or the wider Bush Forever site (629 ha) the percentage loss of these vegetation types would be considerably less. Although the mapping provided in Tingay and Associates (1994) is coarser and subsumes more detailed levels of vegetation variation, it still provides a guide in this respect as per Table 2 below.

Table 2: Representation of and impacts on vegetation types affected by the proposal within the Project Area (see p 23 of the PER), Precinct 5 of the Perth Airport Masterplan, and Bush Forever Site 386 (based on units from Tingay and Associates 1994; impact figures based on revised design shown in Figure 1 of these responses).

Current Representation of Vegetation Types			
Vegetation Type	Project Area	Precinct 5	BF Site 386
1. <i>Pericalymma ellipticum</i> shrubland	7.9 ha	~ 15.2 ha	~ 63.0 ha
2. <i>Melaleuca raphiophyll</i>	2.3 ha	~ 4.5 ha	~ 43.0 ha
3. <i>Banksia attenuata</i> woodland	8.8 ha	~ 11.8 ha	~ 93.5 ha
Percentage impacts by Vegetation Types of the revised design (Figure 1 of the			
Vegetation Type	Project Area	Precinct 5	BF Site 386
1. <i>Pericalymma ellipticum</i> shrubland	7%	4%	< 1%
2. <i>Melaleuca raphiophyll</i>	8%	4%	< 1%
3. <i>Banksia attenuata</i> woodland	3%	3%	< 1%

The proponent maintains that the assessment in the PER of vegetation impacts is accurate, which the revised design has now reduced to only 1 ha of clearing in total.

- 3.10 *'Given that three associations occur within the ramp area, there is an interesting diversity within a limited space, especially as it includes seasonal surface water.'*

The vegetation value of the affected area was recognised in the PER which ascribed these features 'Regional Scale' conservation significance. As noted above (Responses 3.4 and 3.8), it is in recognition of the significance of the area affected by the proposal that the proponent is developing an offset package of similar value.

- 3.11 *'Beauty of Melaleuca woodland would be marred by on-ramp.'*

The proponent recognises that there would be some local loss of visual amenity and that the Melaleuca woodland would be somewhat compromised in this respect. The proponent believes that this must however be evaluated against the existing visual context, which includes Tonkin Highway, Abernethy Road, a wastewater pumping station and a degraded go-kart track to the immediate north. Given these considerations, the visual impact of the on-ramp is likely to be incremental rather than the introduction of infrastructure to an otherwise pristine area.

- 3.12 *'Old Melaleuca tree within close proximity of on-ramp.'*
'Significant tree just north of on-ramp.'

This submission is not quantitative and uses general terms to locate the *Melaleuca* the submitter considers to be significant. If this tree can be accurately located, Main Roads will review design parameters and put construction site management in place such that the tree is retained if possible.

- 3.13 *'Because of the DRF present, no clearing should be allowed.'*
'No clearing within the vicinity of the known habitat of DRF.'

The PER clearly documented that no DRF have been recorded from the land requirement area for the on-ramp. The nearest record is approximately 120 m north of the on-ramp margin (p. 38 of the PER) and would not be affected by the proposed works. See also Response 3.2 above.

- 3.14 *'The vegetation has high regional significance.'*

As noted in Response 3.3 above (and in the PER), it is in recognition of the significance of the affected vegetation types that Main Roads is investing effort in developing a suitable conservation offset package (Commitment 1; p. 81).

- 3.15 *'Vegetation is important for its intrinsic, ecological and social values.'*

Refer Response 3.14.

- 3.16 *'Management measures for V. lindleyi subsp. lindleyi within the project area should be developed in consultation with DCLM.'*

Commitment 4 provided in the PER requires that the proponent develop management measures for this Priority flora species to the requirements of DCLM. DCLM has provided advice direct to the proponent on this issue,

confirming the acceptability of this approach. With the revised design for the on-ramp drainage basin (Figure 1 of these responses), there may be no need to develop management measures specific to this species as the record was from within the area now left untouched inside the curve of the on-ramp (see Figure 1). This will be confirmed with DCLM in accordance with Commitment 4.

4.0 Wetlands

4.1 *'Wetland should be protected.'*

'Project will have an effect on the wetland.'

'Clearing or filling of a wetland is unacceptable.'

'Eliminate an entire succession of vegetation from the seasonally inundated.....to the ...south west portion of the project area.'

'The on-ramp would bring the traffic closer to the wetland and would detract from the value of the conservation reserve as a place people might like to visit to see a fully ecological functioning SCP wetland.'

Main Roads accepts that the wetland in question has high value and that there will be undesirable impacts on it arising from the proposal (see Section 4.6 of the PER). The impacts were quantified in the PER (Section 4.6) and the proponent has evaluated a range of alternatives to minimise these as far as possible (see Section 2.3 of the PER). The revised proposal (see Figure 1 of these Responses) arrived will leave 9.45 ha (93%) of the wetland's extent in the project area uncleared. This area will remain within an area that WAC intends to protect in a Conservation Precinct (No. 5) as identified in the final Perth Airport Master Plan. Main Roads is also developing an environmental offset package to provide for an equivalent conservation value wetland in the same locality to be contributed to the conservation estate.

4.2 *'Don't disturb wetland just for the convenience of motorists.'*

As outlined in Section 1.0 of these Responses, Main Roads is not intending to construct the on-ramp for 'convenience', but rather to address traffic safety issues affecting the wider community in respect of the movement of heavy haulage traffic in Perth suburban areas.

4.3 *'Entire wetland will be affected.'*

'As they are combined systems, impacts on one will diminish the integrity of the wider network of wetlands.'

do not support the proposal on the grounds that there may be wider impacts on the larger wetland area outside of the requirement for the proposed on-ramp.'

'Project would impact upon the whole wetland and on ecological and species linkages to other areas.'

The proponent does not consider it likely that the entire wetland will be significantly affected by this proposal. As stated above (Response 4.1), the majority of the wetland will remain uncleared after the construction of the proposed on-ramp. Drainage controls and other management measures (see Section 4.5.3 of the PER) have been committed to by Main Roads to minimise other indirect effects on the wetland area beyond the on-ramp land requirement. 9.4 ha of the wetland will remain in the Perth Airport Precinct No. 5 (which is

currently planned for conservation purposes), including its ecological links with other wetland areas within Bush Forever Site 386. See also Response 6.3 in relation to indirect impacts beyond the land requirement area,

- 4.4 *'Wetland is linked to one of the top 25 RAMSAR listed wetlands of international importance.'*

It is unclear from this submission which listed wetland is being referred to. From the information available to the proponent, there are no RAMSAR wetlands anywhere in the vicinity of the wetland habitat to be affected by the on-ramp.

- 4.5 *'Best wetland in the BF site.'*
'The wetland threatened by the on-ramp proposal is, to our knowledge, the wetland in the best overall condition of all the wetlands in the airport.'
'Impact one of the most pristine wetland and bushland areas at the Perth Airport. No other wetland areas in Perth are in better condition.'

The proponent would be interested to review the data demonstrating that the wetland involved in this proposal is the best in the airport site. It was the proponent's understanding that Munday Swamp was considered the most significant wetland in the area, given its value to the Western Swamp Tortoise, deeper and more consistent water, high Aboriginal heritage values and other features (Bechtel and Sinclair Knight Merz 2000).

It would therefore appear an even greater claim that the wetland is the best in the entire Perth metropolitan area and Main Roads would again be interested to see the study supporting this view.

Having noted the above, the proponent agrees that the wetland is in excellent condition as documented in several sections of the PER. It is noted that it was the proponent's own evaluation that recommended that the wetland should be re-evaluated and upgraded to a Conservation Category wetland. Main Roads' environmental offset package currently under consideration (Commitment 1) aims to transfer another Conservation Category wetland to the conservation estate.

- 4.6 *'Does not support the proposal on the grounds that the wetland is of high ecological significance. The significance of the wetlands values and functions have been documented in a number of studies. These include: ...Register of the National Estate...Bush Forever...Geomorphic Wetland Mapping.'*

The proponent agrees that the wetland is of high ecological significance (see Response 4.1), but notes that many of the values listed in the studies referred to by this submission actually relate to the wider Perth Airport bushland area more so than specifically to the 1.4 ha to be of land required for the on-ramp. By way of example Bush Forever lists "Declared Rare Flora, Threatened Ecological Communities, Schedule Fauna and Aboriginal Heritage" as some of these values – none of which are contained in the 1.4 ha to be affected by this proposal. See also Response 4.1 and 4.5 above.

- 4.7 *'Runoffs and spillages pose a significant risk and is in conflict with the second objective.'*

The risks associated with road drainage and spillage in respect of wetland water quality were clearly identified and discussed in the PER (p. 72). Main Roads has addressed this risk in the design of the project with the creation of a drainage detention basin which will accept road run-off and also provide for spillage entrapment. A drainage management strategy will also be prepared for the project, including contingency response procedures in the event of a spill occurring on the on-ramp.

- 4.8 *'Roadworks and associated disturbance will inevitably affect water quality.'*

Whilst it is still possible that there will be some long-term reductions in water quality, the proponent believes it has made suitable provision in the design and management of the proposal to minimise this risk (see Response 4.6 above).

- 4.9 *'Stating that a third of the on-ramp site is degraded does not change the fact of the absolute impact in prospect for the wetland/bushland area proper.'*

The clearing figures were provided in this context to demonstrate that the proponent has maximised the use of existing disturbed ground in locating the additional land needed for the on-ramp. The proportion of the on-ramp footprint already cleared is actually 39% (0.9 ha out of 2.3 ha in total) and this is considered a valid analysis of the actual impacts of the proposal to construct the on-ramp. The PER also provided absolute clearing figures for each vegetation type, clearly stating the impacts as well as detailing the use of cleared land for the project (Table 4.2 on p. 66).

- 4.10 *'PER does not address the seasonally inundation of the site.'*
'On-ramp is going to impact upon an area of the wetland that is most likely to hold a reasonable quantity of surface water in a dry year.'
'On-ramp is seasonally inundated (core landscape feature and ecological hub) and surrounded by vegetation.'
'The proportion of paperbark woodland in the path of the on-ramp can be most relied upon to contain a reasonable depth of water every year.'
'Construction of the on-ramp right in the heart of the seasonally inundated wetland basin would be a very severe impact in terms of what it would eliminate and in terms of its on-going impact on the project area.'

Pages 56-60 of the PER discussed the seasonal inundation of wetland present in the project area, including discussions of the likely hydrological function of the wetland. The on-ramp would impact 0.8 ha of the wetland area (8% in total of wetland habitat in the project area), of which 0.2 ha is a linear basin Melaleuca woodland and would hold standing water on a regular seasonal basis. This would leave over 2.0 ha (87%) of the extent of this 'core' deeper wetland area remaining in the adjacent conservation precinct (see Figure 3.1 of the PER). The hydrological assessment completed by Aquaterra (Appendix 6 of the PER) concluded that the proposed on-ramp would be at the 'bottom' of the local surface water drainage catchment and would therefore have little effect on the upgradient wetlands (including the area of free-standing water). It is therefore expected that this deeper wetland portion of the adjacent Precinct No. 5

(identified for Conservation purposes in the Perth Airport Masterplan) would still be seasonally inundated after the construction of the proposed on-ramp. See also Response 2.3.

- 4.11 *'The extraneous earth materials could result in weed introduction, silt and clay suspension and deposition, turbidity in the water, alterations to water chemistry, effects on aquatic invertebrates, the rainfall run-off transfer and deposition of mulching materials and litter in the wetland and many other unacceptable impacts.'*

As outlined in the PER, the risk of weed introduction has been addressed by commitments made by the proponent in terms of materials sourcing (which will be from a certified clean source), weed hygiene management during construction and follow up monitoring and control of weeds in liaison with WAC. Construction of the project would be completed during the dry season (minimising earthworks run-off) and would include surface stabilisation such as landscaping, flattening the inner batter slopes to a 4:1 and kerbing the ramp so that all runoff, except for outer batters, which are at a 3:1, will collect in the sump.

The proponent believes that this will minimise the effects discussed in this submission and will monitor the on-ramp embankment stabilisation and run-off after the construction period, with suitable remedial works as necessary.

5.0 Groundwater and hydrology

- 5.1 *'Hydrological report did not achieve the objectives of the EPA's Guide to EIA Environmental Factors and Objectives. Project is incompatible with the first and third objective.'*

The proponent believes that the assessment completed meets the objectives of these EPA with respect to the hydrology factor.

- 5.2 *'PER failed to acknowledge that the crucial area of greatest seasonal inundation would be severely cut by the on-ramp.'*
'On-ramp impacts on the southern portion of the inundated basin and thus on the water body as a whole.'
'Concerned that the on-ramp impacts upon the area of the wetland most likely to contain a reasonable depth of surface water on an annual basis.'

Refer Response 4.9 above.

- 5.3 *'Water in the wetland would not be separated from the embankments of the ramp. Runoff from the outer embankment is undesirable, as it would contain foreign soil components.'*

Refer Response 4.10 above.

- 5.4 *'Large machinery may leak oil and spill fuel.'*

All machinery will be inspected prior to use on the site to ensure that no significant hydrocarbon leaks are present. No re-fuelling or servicing of plant or equipment will be conducted on the site. Main Roads will also include a

contaminant spill contingency plan as part of the Environmental Management Programme for the project.

- 5.5 *'On-ramp will have an effect on the hydrology of the area, especially with the reduction of surface water.'*

The assessments completed by experienced hydrologists do not suggest that there will be any significant effect on the hydrology of the area (Appendix 6 of the PER). As noted in Response 4.9, the on-ramp is at the bottom of the local surface water catchment and would therefore not cut off surface flows entering the local catchment. There is expected to be little if any reduction in surface water inputs to the local catchment.

- 5.6 *'No data on seasonal water levels.'*
'Inundated areas of a wetland filled by both surface runoff and rising ground water levels. We would have expected a more site-specific hydrological data.'
'Surface water level depths and extent should have been taken and mapped and related to rainfall figures.'
'Paucity of information presented regarding the hydrology of the project area.'
'Groundwater levels should have been measured rather than estimated using data obtained several hundred metres away.'

The hydrology assessment was completed using the best data available for the area in question. As the land has been under the ownership of the Commonwealth Government and managed by WAC, it was not possible for Main Roads to install piezometers on the land or to undertake any other detailed long term investigations of the area. The hydrology report therefore was obliged to extrapolate from the closest seasonal data available on the groundwater and hydrology of the area, which was supplied to the proponent by WAC for this purpose. It was the considered opinion of the hydrologists involved in the study (who have over twenty years' experience in similar assessments) that this was adequate to arrive at an informed assessment of the potential changes to the local hydrological regime presented by the proposed on-ramp.

- 5.7 *'We thought sand was highly porous and inert and one of the reasons why the SCP's groundwater was so susceptible to pollution.'*

Swan Coastal Plain sands are highly porous and inert and for this reason have a good utility in drainage retention/infiltration systems. These systems are efficient at removing gross pollutants (litter and other insoluble matter) and particulate sediments (including a high proportion of the forms of phosphorus and nitrogen bound on to clay particles) (Wong et al. 2000). The remaining soluble pollutants in the drainage may infiltrate over time into the groundwater, but this is expected to be a gradual process and small in magnitude given the catchment area of the on-ramp. As the drainage basin is down-gradient of the wetland, it is not anticipated that any pollutants entering the groundwater in this way would affect the wetland (Aquaterra 2002; Appendix 6). Given the mostly industrial land uses downstream of the on-ramp, it is unlikely that any sensitive bore users would be affected either (see assessment in Aquaterra 2002).

The proponent is also investigating the option of including planting of locally occurring wetland species in the basin to enhance the pollutant control function of the treatment through biological uptake, particularly in respect of soluble nutrient pollutants (Wong et al. 2000). The infiltration approach proposed will also ensure local recharge occurs to minimise hydraulic alterations to the local groundwater regime. The drainage management strategy for the on-ramp, including protection measures for the local wetland and groundwater system, will be finalised prior to construction under advice from the Water and Rivers Commission and the DEP.

- 5.8 *'MRWA has barely attempted to show how its proposal will alter the flows and distributions of water in the area.'*

The proponent believes that the hydrological assessment (in addition to the drainage design work carried out for the on-ramp) is adequate to provide for an assessment of the potential alteration of local hydrology arising from the proposed on-ramp. The assessment completed was the most comprehensive possible with the available data (see Response 5.6 above).

6.0 Bush Forever / Offsets

- 6.1 *'Area forms part of a larger conservation area.'*

Main Roads recognises that the area forms part of a Bush Forever site and part of an area intended for Conservation in the Perth Airport Masterplan (Precinct No. 5) – a considerable portion of the PER discussed these matters (Sections 3.5, 4.7 and 5.3). Planning and option evaluation studies were carried out by the proponent in an effort to minimise the land required from the conservation area (Section 2.3 of the PER). Main Roads has also made a commitment to supplying an environmental offset package as part of the proposal to ensure a net benefit outcome for conservation values in the area.

- 6.2 *'The loss of this area will significantly reduce the conservation value of the adjacent bushland and would detract from the BF site.'*

'On-ramp significantly diminishes the conservation area's conservation value.'

'Likely to impact upon the viability of the overall airport site and the integrity of the ecosystem processes present.'

As noted in Response 6.1 above, Main Roads has attempted to minimise the impacts of this proposal on the conservation values of Bush Forever site 386. The PER provides a quantitative account of the flora, fauna and wetland values within the site that would be impacted by the proposal. The proposal affects significant conservation value features, but the use of the term 'significant reduction' is not warranted when the proposal would result in the removal of 1.4 ha from the 629.5 ha extent of Site 386 (0.2% by area). The proposal will clearly detract from the local values on the south-west margin of Site 386, but Main Roads intends to provide a conservation package as part of the proposal to offset this.

- 6.3 *'Increase the likelihood of other impacts affecting the adjacent bushland, eg dieback, weeds, fire, noise, litter and other edge effects.'*
'Likely to be firebreaks, weed invasion and increased motorbike and vehicle usage in the bushland.'
'On-ramp would bring traffic closer to the bushland and therefore make it more susceptible to litter, weed seeds etc.'
'Indirect impacts are inevitable, not potential. More of a fire risk.'

The above submissions appear to reiterate potential impacts of the proposal that were all recognised, assessed and discussed in the PER (see p. 67-68). Many of these impacts (particularly those relating to human use) already exist in the area and the proposed on-ramp would not be likely to worsen these. Main Roads has provided management commitments to address these potential impacts during and after construction of the on-ramp (Section 4.3 of the PER).

- 6.4 *'Development would have an adverse impact on whatever is left through the increase in edge effects.'*
'Not a small disturbance as the edge effects could be large.'

The total perimeter of the conservation area would not be significantly altered by the proposal. The perimeter of the block of vegetation defined as the 'project area' (see p. 23 of the PER) as it stands is currently approximately 2,065 m, with the removal of the land required for the on-ramp, this would change to approximately 2,018 m. The boundary:area ratio of the project area will therefore change from 253,000m²:2,065m (122.5:1) to 239,000m²:2,018 m (118.4:1). The change in perimeter area on the scale of Conservation Precinct No. 5 and the Bush Forever Site as a whole would be even smaller in magnitude. As noted in the PER (Section 4.0) and in Response 6.3 above, many of the edge effect type impacts already exist in the project area.

In addition, Main Roads has conducted further liaison with WAC in respect of fire break requirements around the future land requirement for the on-ramp. WAC's management has indicated that it currently has no intentions of creating any additional access or firebreaks in that immediate area.

- 6.5 *'Clifford St Wetland should be added to the conservation estate but not used as an offset as they are not effective conservation tools.'*
'Clifford St Bushland is not a good option as it is small, isolated and not contiguous with any other bushland in the area. Its long term future is less secure as it is not a Bush Forever site.'
'Clifford St should be conserved but not ransomed.'
'Does not support the proposal on the grounds that the proposed offset strategy is not appropriate given the ecological significance of the site.'
'Opposes offset packages not acceptable.'

Given that the impacts on Bush Forever site 386 cannot be further reduced through either alternative transport solutions or design measures, Main Roads believes it is appropriate to put forward a conservation based offset package as part of the on-ramp proposal. Considerable effort has been invested in searching for suitable areas in the locality for this approach, including the investigation of three other options as outlined in the PER (p. 79-80). Submissions from both the Bush Forever Office and the Department of Conservation and Land Management

(DCLM) indicated that a conservation-based offset approach was appropriate. The DCLM further indicated that whilst Lot 109 alone was not sufficient, the provision of all of Site 53 surplus to the highway reservation might form part of a suitable package. The Bush Forever Office submission indicated that the offset approach (and the proposal) could be deemed acceptable subject to resolving implementation timing and the features of the offset site (no net loss of area, vegetation condition or conservation category wetland functionality). The proponent is accepting of the positions of both DCLM and the Bush Forever Office and is participating in discussion with these agencies and DEWCP to finalise a suitable package.

As outlined in the following Response (6.3) the proponent also intends to include the revegetation and creation of a green-belt corridor linkage between Bush Forever sites 386 and 319 as part of this package, further improving conservation values in the immediate locality of the project.

- 6.6 *'Site is close to BF site 319. Should MRWA be responsible for creating a corridor to link these sites?'*
'Needed to provide a green belt.'
'On-ramp would greatly detract from the objective of linking BFS386 to BFS319'
'The on-ramp site is the closest linking point between BFS 386 and BFS319. Tonkin Highway is the only remaining significant link. On-ramp will become a significant hurdle.'

The proponent agrees with the suggestion made in the above submission and will now include a revegetation and 'green-belt' enhancement programme as part of its offset package (Commitment 1). At this stage it is proposed that this will comprise the revegetation of the eastern side of the Tonkin Highway reservation using locally sourced mulch and topsoil (surplus from the clearing of the on-ramp site), provenance seed and locally occurring flora species. This corridor linkage will be created between Bush Forever site 386 (Perth Airport bushland) and site 319 (Dundas Road bushland), and probably represents the only remaining opportunity to create such a corridor link in the area. The advancement of this proposal will be discussed with DCLM and DEP as part of the finalisation of the proposed conservation offsets package committed to in the PER.

- 6.7 *'On-ramp could be breaching a number of agreements including the Convention on Biological Diversity, Ramsar Convention, Conservation of Migratory Species of Wild Animals, JAMBA, CAMBA, EPBC, Asia Pacific Migratory Waterbird Conservation Strategy and the National Strategy for the Conservation of Australia's Biological Diversity.'*

Main Roads believes that all biodiversity issues and statutory responsibilities are addressed by State and Federal approvals processes.

- 6.8 *'Group is against clearing of vegetation in Bush Forever sites in their district.'*

Main Roads acknowledges the above submission, but considers there is no other viable option for this proposal but to clear 1.4 ha of the 629.5 ha of site 386 (representing 0.2% by area) (see Section 2.3 of the PER and also Response Section 1.0 above).

- 6.9 *'Should be retained in the interest of the whole community.'*
'Should not be allowed if there is any community value placed on the bushland.'

It is in the interests of the community that Main Roads is proposing to construct the on-ramp. As outlined in Response Section 1.0, the on-ramp is required to provide for safer integration of heavy haulage traffic with other sectors of the community. The situation presented by this proposal is one where competing community needs are evaluated – the proponent believes that the proposal as presented (including the supply of other conservation initiatives) provides the best balance of these competing community interests.

- 6.10 *'Area between the bushland and the on-ramp has been cleared.'*

This clearing work referred to is understood to be outside of the Bush Forever site, was not conducted by Main Roads, and is not part of the proposal currently under assessment.

- 6.11 *'MRWA tries to assert that its on-ramp is somehow the final natural area subtraction this area will suffer forevermore.'*

It was not Main Roads' intention to assert that this proposal would be the final subtraction. The proponent has provided information based on its requirements for the project and the information forwarded by WAC on the area. The assessment in the PER (p. 76) was a carefully reasoned and qualified view that suggested that the planning process that developed the Perth Airport Master Plan (and the fact that WAC and the State Government have now signed an agreement based on it) should mean that the area is less likely to experience further, currently unidentified clearing.

- 6.12 *'A very special corner of the airport's total bushland area.'*
'Shouldn't be damaged because of its flora, fauna and Aboriginal heritage values and its beauty and spirit.'

The proponent acknowledges the social and environmental values ascribed to the area in these submissions. As documented in the PER, all impacts on the area have been reduced as far as possible through planning, option evaluation, design and management commitments. An appropriate offset package is also being developed by Main Roads in recognition of the values affected by the proposal.

- 6.13 *'Motorists will be upset to see the bushland bulldozed'*
'The project area creates a visually pleasant outlook from Tonkin Hwy.'

The proposed on-ramp is being created to ensure that motorists in the area have a safer and less traumatic road experience (see Section 1.0 of these Responses above). The proponent considers that the view from the approximately 8 km length of Tonkin Highway that passes adjacent to the Perth Airport bushland will remain largely unchanged by the removal of the ~0.1km length of adjoining vegetation. Main Roads also intends to revegetate the section of the Tonkin Highway reservation from Bush Forever site 386 to 319 as part of the proposal (see Response 6.6). Considering this, there may actually be a longer length of vegetation visible in the outlook from Tonkin Highway in this area after the implementation of the proposal.

6.14 *'Assurances to manage the various impacts are very unconvincing.'*

MRWA recognises the environmental values of the project area and will endeavour to ensure that any commitments to manage the potential impacts will be implemented to the satisfaction of the various agencies. To date MRWA has liaised extensively with the involved agencies in an effort to meet their management requirements and is confident that these can be met. The implementation of these environmental management measures during construction will also be independently audited as detailed in the PER (p. 81).

6.15 *'Significant blot on the aesthetic qualities of the wetland and reduces the potential the area has for ecotourism.'*

As noted in several Responses above, the direct impacts on the area in question have been reduced as far as possible by Main Roads. The area is already unsuitable for ecotourism ventures given its ownership by the Commonwealth and management by WAC. This means that ecotourism ventures would be extremely unlikely to gain approval to operate in the area.

7.0 Other Management Agencies / Other Miscellaneous Comments

7.1 *'City of Belmont is supportive of the proposal.'*

The proponent acknowledges the support of the relevant local government agency for this proposal.

7.2 *'No mention of the on-ramp in the Perth Airport Master Plan.'*
'The On-ramp was not shown in the Draft Airport MP.'

The on-ramp was not detailed in the Draft Perth Airport Master Plan because the draft plan was released for comment prior to the interchange concept being finalised. Once the interchange concept had been confirmed, Westralian Airports Corporation was advised of the necessary details so that it could be included in the final version of the Master Plan. This occurred as part of the normal consultation / review process involved with finalising the Draft Master Plan to its final version, which showed the on-ramp.

7.3 *'Appalled at the level of habitat destruction currently occurring on Commonwealth Land by the Perth Airport administrators.'*

'WAC is fragmenting and degrading wetland and bushland areas.'

'Because of the lack of protection for the bushland in the airport site, high conservation value bushland should be saved.'

The management of the airport land is the responsibility of Westralian Airports Corporation (WAC) and not Main Roads.

7.4 *'Vegetation within the Conservation Precinct No 5 is not necessarily protected.'*

Whilst Main Roads is not responsible for the management of the Perth Airport site, it has developed and assessed the on-ramp proposal against the context of the WAC Airports Master Plan for the wider area. It is the proponent's

understanding that the Master Plan has been formally agreed to by WAC and the State Government. Given this, the PER assessment was carried out on the assumption that the plan will be implemented as shown, including the intention to protect the area of Precinct No. 5 for conservation purposes. As noted above, the management of the wider airport land is the responsibility of WAC, not the proponent for the current proposal.

- 7.5 *'Water and Rivers Commission requests that the agency be listed as an advisory body for proponent commitments number one 'Environmental Offset' and commitment number two 'Environmental Management Programme'.'*

The proponent will amend these commitments as requested to include the Water and Rivers Commission as an advisory agency.

- 7.6 *'All wetlands on the airport site should be protected permanently.'*

WAC, EPA and other agencies to respond.

- 7.7 *'MRWA should be disbanded.'*

Beyond the scope of the formal environmental assessment process.

- 7.8 *'Area already under stress from industrial developments.'*

EPA to respond.

- 7.9 *'The SCP ecosystem is near breaking point.'*

'Government not enforcing its policy of no further infilling of remaining wetland on the SCP.'

EPA to respond.

- 7.10 *'Vital that Perth's seasonal wetlands remain in excellent condition and that their associations with other bushland areas are not lost.'*

'The remaining wetlands are valuable.'

'Reduction or destruction of wetlands should stop.'

'Lost too many wetlands on the SCP.'

EPA to respond.

- 7.11 *'No confidence in the Commonwealth and State approvals process.'*

EPA and Environment Australia to respond.

- 7.12 *'Approval will only encourage further development proposals at the Perth Airport.'*

EPA to respond.

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