

Roe Highway Stage 7 Extension (South Street in Canning Vale to Kwinana Freeway in Leeming)

Main Roads Western Australia

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

**Environmental Protection Authority
Perth, Western Australia
Bulletin 1138
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Environmental Impact Assessment Process Timelines

Date	Progress stages	Time
27 January 2003	Level of Assessment set (including 2 week statutory appeal period)	3 weeks
27 January 2004	Proponent Document Released for Public Comment	1 year
23 March 2004	Public Comment Period Closed	8 weeks
31 May 2004	Final Proponent response to the issues raised	10 weeks
8 June 2004	EPA report to the Minister for the Environment	1 week

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Summary and recommendations

Main Roads Western Australia (MRWA) proposes to extend Roe Highway from South Street in Canning Vale to Kwinana Freeway in Leeming over a distance of approximately 4.5 kilometres. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the environmental factors relevant to the proposal.

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.

Relevant environmental factors

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

- (a) Declared Rare Flora – impact on *Caladenia huegelii*;
- (b) biodiversity - impact on terrestrial flora and fauna; and
- (c) noise – impact on residential community closest to the highway.

There were a number of other factors which 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 extend Roe Highway from South Street in Canning Vale to Kwinana Freeway in Leeming. This alignment incorporates the proposed northerly alignment as approved by the Western Australian Planning Commission (WAPC).

The total footprint of the project area encompasses 62 hectares (ha) of which 53.9 ha will be cleared. The proposed highway passes through an area between Ken Hurst Park and John Connell Reserve that contains a species of Declared Rare Flora (DRF), the Grand Spider Orchid, *Caladenia huegelii*.

Through implementation of the proposal, approximately 74 plants will be directly affected. This number differs from the original 86 indicated in the PER document due to the adoption of the northerly alignment in order to avoid 20 and the redesign of the road in the vicinity of the landfill.

The EPA is aware that in response to community concerns the proponent realigned the Principal Shared Path (PSP) from the rear of residential properties to the road shoulder along the northern side of the alignment. However, in the area bounded by Dundee Street and Hollingsworth Way this would have led to an additional 30 plants being directly affected. Following consideration by the proponent of the environmental and social issues associated with the realignment of the PSP, the EPA

strongly supports MRWA's decision to realign the PSP in this area to avoid these plants.

As a consequence, the EPA notes that the PSP in the area bounded by Dundee Street and Hollingsworth Way will need to be relocated to the rear of properties, as originally proposed, to avoid these critically endangered plants.

Subsequent to the release of the Public Environmental Review (PER) document, the proponent has developed a Mitigation and Offset Strategy to avoid, reduce and compensate the unavoidable biological impacts associated with the proposal.

The key aspects of the mitigation and offsets strategy include:

- (i) avoiding and reducing impacts through engineering design modifications which will lead to a 7 ha reduction in the area impacted and avoidance of approximately 20 *Caladenia huegelii* plants by adopting the northerly alignment route;
- (ii) impact reduction measures (operational and management controls) that will see amongst other things the maintenance of habitat through rehabilitation of disturbed land and fauna management; and
- (iii) environmental offsets to compensate unavoidable impacts that may affect:
 - the viability of populations of *Caladenia huegelii*;
 - the extent, quality, connectivity and level of protection of remnant Banksia woodland;
 - the access of local residents and other s to areas of natural bush; and
 - the extent, quality and level of protection of habitat used for feeding by Carnaby's Black Cockatoos.

The EPA notes that the combined offsets provide for:

- securing approximately 16 ha of high quality remnant Banksia woodland, including land known to contain *Caladenia huegelii*, by placing this land into the conservation estate;
- securing an additional 11 ha of land to be incorporated into the conservation estate (Ken Hurst Park); and
- restoration of approximately 5 ha of degraded bush in the project area.

The EPA considers that any 'surplus' land to that identified in the mitigation and offset strategy and for the construction of the highway should be secured for conservation rather than being set aside or disposed of for other purposes.

The offset strategy also:

- provides for a contribution towards the purchase of a parcel of land at Gay Street Huntingdale or an equivalent area to secure an 'at risk' population of *Caladenia huegelii*; and
- makes a substantial contribution to genetic and ecological research aimed at ex-situ conservation and propagation of *Caladenia huegelii*, and if successful, will improve the 'at risk' status of the species.

The EPA considers that the protection and enhancement of remnant bushland in the vicinity of the project area through conservation covenants and placing areas into the conservation estate is considered to offer the best opportunity for preserving

ecological integrity and biodiversity as it will result in a large extent of contiguous bushland being protected, provide better connectivity for fauna habitats, and reduce the chance of habitat decline through edge effects.

The EPA is aware that techniques for translocation of *Caladenia huegelii* have not been successfully demonstrated and hence information regarding translocation is limited. Accordingly, the EPA recommends that the proponent prepare a *Caladenia huegelii* translocation and monitoring management plan and that this be developed in conjunction with the Department of Conservation and Land Management and the Kings Park Botanic Garden and Parks Authority.

In addition, to assist in ensuring that reasonable revegetation expectations are met, the EPA recommends that the proponent prepare a detailed Rehabilitation Plan detailing restoration and management measures, a rehabilitation schedule and community consultation and involvement.

With regard to fauna, the EPA considers that the loss of some native vegetation along the proposed Roe Highway extension will not have a significant impact on the overall feeding area used by the Carnaby's Cockatoos and that the range of management measures to be implemented as part construction and operation of the proposed highway will minimise impacts on fauna and fauna habitats.

In relation to noise, the EPA notes that construction and traffic on the highway will alter the noise environment for the residential community closest to the highway. The EPA notes that an independent review of the noise impact assessment concluded that the methodology, assumptions and calculations used to design the noise barriers for the proposal are reasonable and that the noise sensitive receivers adjacent to the highway are likely to receive noise levels below the MRWA criteria of 63dB(A) for day time noise and 55 db(A) for night time noise through the provision of a range of noise attenuation criteria.

The EPA has concluded that the proposal may be implemented subject to:

- a) implementation of the northerly alignment, approved by the WAPC on 15 April 2004, within 18 months;
- b) the acquisition of the Huntingdale land or an equivalent area of comparable ecological value within 12 months;
- c) implementation of the mitigation and offset strategy;
- d) demonstration within 18 months that the mitigation and offset strategy has been fully implemented; and
- e) implementation of the proponent's commitments.

The EPA notes that many submissions raised issues relating to the justification of the proposed highway, including the consideration of alternative alignment options. The EPA acknowledges the process that was used in determining the alignment for the Roe 7 corridor and notes that the highest ranked alignment option was subsequently accepted by the State Government. The EPA, however, can only assess the proposal as presented to it by the proponent.

The EPA notes that the Kwinana Freeway/ Roe Highway interchange has been designed consistent with the outcomes of the Freight Network Review and that this

makes no provision for a westward extension (i.e. Roe 8) in accordance with Government's decision not to construct Stage 8 of the Roe Highway.

The EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of their commitments and the recommended conditions set out in Appendix 5 and summarised in Section 4.

Recommendations

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

1. That the Minister notes that the proposal being assessed is for the extension of Roe Highway (Stage 7) from South Street in Canning Vale to Kwinana Freeway in Leeming;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 5, and summarised in Section 4, including the proponent's commitments;
4. That the Minister imposes the conditions and procedures recommended in Appendix 5 of this report.

Conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Main Roads Western Australia to extend Roe Highway from South Street in Canning Vale to Kwinana Freeway in Leeming is approved for implementation. These conditions are presented in Appendix 5. Matters addressed in the conditions include the following:

- (a) that the proponent fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 5;
- (b) the acquisition of the Huntingdale land or an equivalent area of comparable ecological value within 12 months following the issuing of the notice under S45(7) of the *Environmental Protection Act 1986*;
- (c) implementation of the northerly alignment, as approved by the Western Australian Planning Commission on 15 April 2004, within 18 months of the issuing of the notice under S45(7) of the *Environmental Protection Act 1986*;
- (d) demonstration within 18 months following the issuing of the notice under S45(7) of the *Environmental Protection Act 1986*, that the mitigation and offset strategy has been adequately implemented;
- (e) the preparation and implementation of a rehabilitation plan; and
- (f) the preparation and implementation of a *Caladenia huegelii* translocation and monitoring management plan.

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6. Addendum (on CD) to the PER containing:
 - Summary of submissions and proponent's response to submissions
 - Mitigation and Offset Strategy
 - Air Quality:
 - Independent Review of Air Quality Impact Assessment
 - Regional Air Quality Study
 - Independent Review of Noise Impact Assessments
 - Draft *Caladenia huegelii* Conservation and Management Plan

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 extend Roe Highway from South Street in Canning Vale to connect to Kwinana Freeway in Leeming, a distance of approximately 4.5 kilometres (km).

Land for the highway was set-aside in the Metropolitan Region Scheme (MRS) in 1963 (MRWA, 2004a). The alignment for this section of Roe Highway has most recently been part of extensive discussions and consultation through the Metropolitan Freight Network Review, which was aimed at devising better ways of moving freight within the metropolitan area (DPI, 2003).

The review confirmed the need for a connection between the end of Roe Highway Stage 6 at South Street and Kwinana Freeway as a key element in sharing the freight and general vehicle traffic load with other arterial roads in the area.

Following the completion of the Freight Network Review, the Minister for Planning and Infrastructure established a Local Impacts Committee (LIC) to consider the implications of freight movement in the southwest metropolitan area and several possible variations of the route for the highway extension between South Street and Kwinana Freeway. The alignment that follows the MRS alignment was identified as the preferred option.

MRWA referred the road proposal to the EPA in January 2003 and the level of assessment was set at Public Environmental Review (PER). The PER (MRWA, 2004a) was released for an eight week public review period from 27 January 2004 to 23 March 2004.

Whilst MRWA is the proponent for the Roe Highway Stage 7 proposal, MRWA has determined that delivery of the final design, construction and maintenance for two years after practical completion, will be by an alliance contract. The alliance for this project comprises MRWA (owner participant), Henry Walker Eltin Contracting Pty Ltd, Clough Engineering Limited and Maunsell Australia Pty Ltd (non-owner participants).

The proposal to construct Roe Highway Stage 7 has also been determined to be a controlled action under the *Environment Protection Biodiversity Conservation Act 1999*. The Commonwealth has accredited the PER assessment process and identified that the Carnaby's Black Cockatoo (*Calyptorhynchus latirostri*) and the Grand Spider Orchid (*Caladenia huegelii*) are considered relevant to Commonwealth approval and will require assessment.

As part of the assessment, the EPA inspected the Project Area, held discussions with residents and community groups, and undertook discussions with the proponent and stakeholders. The EPA also met with members of the Community Reference Group (CRG), established for the project, comprising residents of the affected area, special

interest groups such as Friends of Ken Hurst Park, representatives of affected local government authorities and interested parties.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the environmental factors relevant to the proposal. The conditions and commitments to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides Other Advice by the EPA, Section 6 presents the EPA's conclusions and Section 7, the EPA's Recommendations.

References are cited in Appendix 1 and a list of submitters appears in Appendix 2. Fifty eight submissions were received. Two submissions incorporated 68 and 228 form letters respectively, whilst another included a 556 signature petition. Of these submissions, only two supported the proposal.

Appendices 3 and 4 identify the relevant environmental factors and summarise their management. Appendix 5 contains the recommended environmental conditions and commitments and Appendix 6 contains an Addendum to the PER (please refer to the CD at the back of this report) which includes: i) the summary of submissions and the proponent's response; ii) the mitigation and offset package; iii) an independent review of noise impact assessments; iv) an independent review of the air quality impact assessment; v) an independent regional air quality study; and v) a draft *Caladenia huegelii* conservation and management plan.

The summary of submissions and proponent responses 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

MRWA proposes to extend Roe Highway from South Street in Canning Vale to connect to Kwinana Freeway in Leeming over a distance of approximately 4.5 km (Figure 1). The highway is planned as a four-lane dual carriageway (two lanes in each direction), with provision for future upgrading to three lanes in each direction. The land required for any future upgrading will be provided in the median strip.

The total footprint of the project area represents 62 hectares (ha). Approximately 53.9 ha of this area will be cleared in two stages: i) Stage A– in the areas required for bridge construction at South Street, Karel Avenue and Kwinana Freeway, and for the section of highway between Karel Ave and Kwinana Freeway; and ii) Stage B – the remainder of the areas, following translocation of *Caladenia huegelii* individuals. The remaining 8.1 ha is existing degraded land.

The proposed Roe Highway Stage 7 corridor passes through an area between Ken Hurst Park and John Connell Reserve that contains a species of Declared Rare Flora

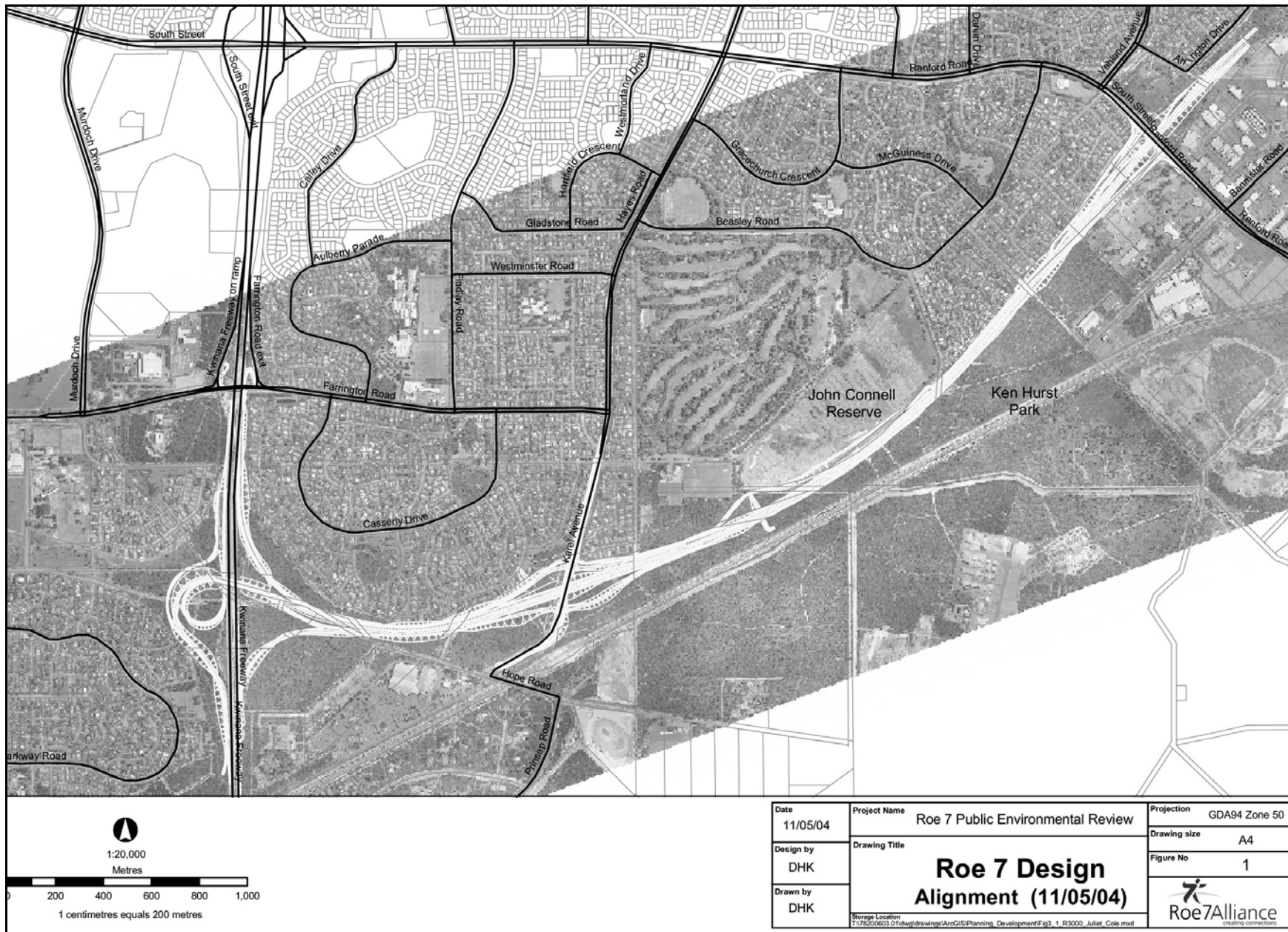


Figure 1: Roe Highway Stage 7 Alignment

(DRF), the Grand Spider Orchid, *Caladenia huegelii*. Through implementation of the proposal, approximately 74 plants will be directly affected. This number differs from the original 86 indicated in the PER document due to the adoption of the northerly alignment in order to avoid 20 plants, and the redesign of the road in the vicinity of the landfill.

The EPA is aware that in response to community concerns the proponent realigned the PSP from the rear of residential properties to the road shoulder along the northern side of the alignment. However, in the area bounded by Dundee Street and Hollingsworth Way this would have led to an additional 30 plants being directly affected. Following consideration by the proponent of the environmental and social issues associated with the realignment of the PSP, the EPA strongly supports MRWA's decision to realign the PSP in this area to avoid these critically endangered plants.

With regard to the northerly alignment, approval has been sought by the proponent to allow the use of this alternative alignment as it involved excursions beyond the existing MRS Reserve into the adjoining Parks and Recreation Reserve.

The City of Melville supported the northerly alignment within the Primary Regional Road reservation at its Council meeting on 17 February 2004. On 15 April 2004, the Western Australian Planning Commission (WAPC) granted development approval subject to five conditions. These five conditions relate to:

- rationalisation of the boundaries and tenure of redundant and/or piecemeal parcels of government land in the vicinity of the Roe Highway Primary Regional Road Reserve, with a view to enhancing the management and protection of natural environment, by their incorporation into either John Connell reserve or Ken Hurst Park;
- re-instatement of any portion of John Connell Reserve and or landfill disturbed by the highway;
- the preparation and implementation of a landscape and management plan;
- dust control measures be implemented to minimise any potential and actual dust nuisance; and
- no light spill is to occur into the adjoining residential properties.

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in Section 3 of the PER (MRWA, 2004a).

Table 1: Summary of key proposal characteristics

Element	Description
Proposal description	Design, construct and operate a four lane highway from South Street to Kwinana Freeway, with allowance for future widening to six lanes. The proposal includes construction of all road pavements, access roads, drainage basins, drains, medians, grade separated interchanges, ramps, traffic signals, associated earthworks, Principal Shared Paths, other shared paths, road bridges, underpasses, culverts, lighting, noise barriers, fencing, landscaping and signs.
Length of highway	Approximately 4.5 km.

Area of road reserve	Approximately 130.6 ha.
Cross-section – first stage two lanes in each direction	3.0m shoulder, 2 x 3.5m lanes, 1.0m shoulder, 13m median (including median shoulders), 1.0m shoulder, 2 x 3.5m lanes and 3.0m shoulder.
Cross-section – ultimate stage three lanes in each direction	3.0m shoulder, 3 x 3.5m lanes, shoulder median, shoulder (width of all to be determined), 3 x 3.5m lanes and 3.0m shoulder.
Area of surfaced road	Approximately 18 ha including interchanges (Stage 1).
Area of clearing	Approximately 62 ha (including batters and drainage basins, and approximately 8 ha of already degraded areas).
<i>Caladenia huegelii</i> directly affected by the proposed route	Approximately 74 individuals.
Area to be revegetated	Approximately 31 ha (including batters and drainage basins).
Construction duration	Constructed over a period between July 2004 and December 2005.
Grade separated intersections	South Street, Karel Avenue, Kwinana Freeway.
Bridges and Underpasses	Road bridges at South Street (two bridges), Karel Avenue and Kwinana Freeway; and pedestrian underpasses at South Street off-ramp and Karel Avenue.
General standard of design and construction	Design speed 70kph to 100kph – Austroads and Main Roads Western Australia standards.
Construction and materials source	Road constructed in cut and fill. Additional fill obtained from approved sources (eg sand mines) and suppliers.

Since the release of the PER the proponent has:

- made a number of modifications to the proposal;
- developed a Mitigation and Offsets Strategy;
- commissioned independent reviews for air quality and noise and a regional air quality study; and
- prepared a draft *Caladenia huegelii* Conservation and Management Plan.

The key aspects of the mitigation and offset strategy (refer to the attached CD that forms Appendix 6 within the back cover of this report) as proposed by MRWA comprises:

1. Avoiding and reducing impacts through engineering design modifications.

The effect of the design modifications is an approximate 7 ha reduction in the extent of native vegetation that will be disturbed (through reducing the median width) and avoidance of approximately 20 *Caladenia huegelii* plants by adopting the northerly alignment route. The design changes also result in more effective noise control and lower impacts on residential amenity during and after construction by locating the PSP adjacent to the road shoulder, with the exception of the area bounded by Dundee Street and Hollingsworth Way, instead of constructing the PSP as a separate lane running adjacent to residential properties to the north of the road. Further fill, mulch, topsoil and other materials will be stockpiled outside the road reserve.

2. Impact reduction measures (operational and management controls).

Such measures include:

- reducing truck movements during construction;
- salvage and translocation of *Caladenia huegelii*;
- maintaining habitat which will see approximately 30 ha of land disturbed during highway construction being rehabilitated. The proposed landscaping includes establishment of approximately 6000 Banksias, which when mature, will provide food to support a population of approximately 25 Carnaby's Cockatoos;
- preventing the spread of dieback and weeds;
- fauna management – including trapping and relocating the quenda, fencing, provision of underpasses; and
- noise management measures.

3. Environmental offsets.

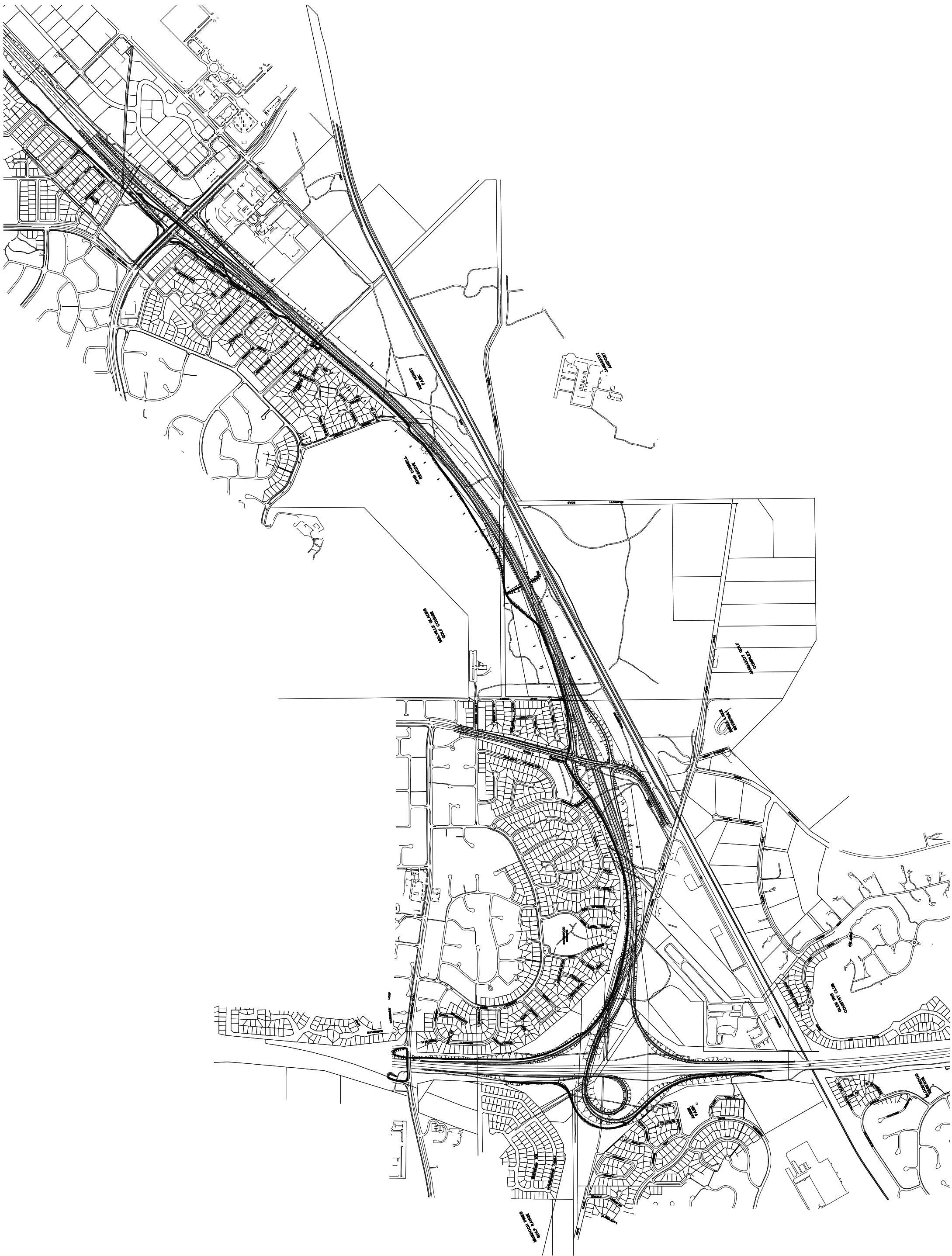
In developing the mitigation and offset strategy, MRWA developed a package to compensate unavoidable impacts that may affect:

- viability of populations of *Caladenia huegelii*;
- extent, quality, connectivity and level of protection of remnant Banksia woodland;
- access of local residents and others to areas of natural bush; and
- extent, quality and level of protection of habitat used for feeding by Carnaby's Cockatoos.

The offset strategy includes placing high quality Banksia woodland into the conservation estate (see Figure 2) as detailed in Table 2.

Table 2: Land Rationalisation Areas

Offset	Area
Area A	Place covenant over approximately 4.5 ha of land near Fern Leaf Court and place into conservation estate. Transfer land from Commissioner for Main Roads to a Class A Crown Reserve, vested in the City of Melville, and included as part of John Connell Reserve.
Area B	Land rationalisation to allow approximately 4.7 ha of land south of Roe 7 to be incorporated into Ken Hurst Park. Transfer ownership to a Class A Crown Reserve to be managed as part of Ken Hurst Park.
Area C	Land rationalisation of approximately 6.3 ha of land (located to the northwest of Marriot Road, north of the railway line) owned by the Commissioner of Main Roads to allow incorporation into Ken Hurst Park. Transfer ownership to a Class A Crown Reserve to be managed as part of Ken Hurst Park.
Area D	Land rationalisation and covenanting approximately 6.5 ha of land (immediately south of the Kwinana interchange area) owned by the Commissioner of Main Roads and land owned or vested in Western Power or transfer to Crown land vested in an appropriate management agency.
Area E	Covenant approximately 5.1 ha or remnant bushland in the vicinity of Roe 7/ Kwinana Freeway owned by the Commissioner of Main Roads.



Other offsets include:

- contributing to orchid research by the Kings Park Botanic Gardens and Parks Authority (BGPA) which involves a five year programme of targeted genetic and ecological research to enable successful ex-situ conservation of *Caladenia huegelii* and includes research into pollinators and symbionts. The proponent has valued the research contribution at \$192,000;
- contributing towards securing 'at risk' population of *Caladenia huegelii* on parcel of land at Gay Street and Warton Road, Huntingdale;
- matching funding to City of Melville for implementation of Ken Hurst Park Management Plan;
- provision of connectivity to Ken Hurst Park;
- environmental education initiatives; and
- restoration of degraded areas in road reserve or in adjoining bush areas.

The proponent has valued its mitigation and offset strategy at over \$4.5 million dollars and is exclusive of any contributions to the securing of land at Huntingdale. The mitigation and offset strategy is discussed in more detail under Section 3.

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.

The identification process for the relevant factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors, such as residential amenity (light, visual amenity, recreation, air quality, heritage, risk) and proximity of the underground water pollution control area including surface water quality and groundwater quality, are very relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

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

- (a) Declared Rare Flora –impact on *Caladenia huegelii*;
- (b) biodiversity (impact on terrestrial flora and fauna), and
- (c) noise - impact on residential community closest to the highway.

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.

Details on the relevant environmental factors and their assessment are contained in Sections 3.1 - 3.3. The description of each factor shows why it is relevant to the

proposal and how it will be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

3.1 Declared Rare Flora – Impact on *Caladenia huegelii*

Description

The Grand Spider Orchid, *Caladenia huegelii*, is a Declared Rare Flora (DRF) under the *Wildlife Conservation Act 1950* and is listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*. *Caladenia huegelii* has an underground tuber which sprouts after the first autumn rains, flowers in spring and then dies back to become dormant over summer. The flowers are pollinated by a single species of thynnid wasp and once pollinated is capable of producing thousands of minute, wind-dispersed seeds. However, very few seeds appear to germinate in nature and this low germination rate may be associated with the orchid's symbiotic association with mycorrhizal soil fungi (MRWA, 2004a).

On the basis of survey results undertaken and information contained within CALM's database, the EPA notes that there are approximately 34 *Caladenia huegelii* populations consisting of approximately 698 plants, of which an estimated 520 plants occur in one population at Ken Hurst Park (MRWA, 2004a). Five of the 34 populations (and a further 4 subpopulations) are considered extinct due to urban development and 18 populations each have less than 5 flowering plants recorded. Of the recorded populations, two are in secure conservation areas in Kooljerrenup Nature Reserve and Ruabon Nature Reserve (Busselton) and ten populations are threatened from development and mining, including the five largest populations (MRWA, 2004a).

Through implementation of the proposal, including incorporation of the northern alignment, approximately 74 individual plants will be directly affected by the proposal.

Submissions

Key comments raised by state, federal and local government focused on:

- the need for a mitigation and offset package that provides tangible outcomes minimising conservation losses for *Caladenia huegelii*;
- the need to purchase suitable offset land to compensate for the loss of *Caladenia huegelii*. Any delay in considering purchase of land, until after translocation has been shown to be unsuccessful would be inappropriate as any delay in seeking offset land purchases may result in the loss of potential acquisition areas, and thus the inability to mitigate the proposed loss of plants and habitat;
- translocation should not be considered an offset or mitigation for the loss of a significant area of habitat for this species;
- successful translocation not being proven;
- the potential impacts on pollinator species;
- the lack of detail regarding the *Caladenia huegelii* research program;
- the viability of long-term conservation of *Caladenia huegelii*;

- the need to provide details on measures to avoid and minimise impacts;
- the proposed offset compensation, and cost of mitigation measures;
- measures to avoid and minimise impacts;
- how the translocation will be implemented, managed, monitored and evaluated in accordance with procedures outlined in the Guidelines;
- resources, time and funding to be allocated to the development, monitoring, management and evaluation of the translocation programme;
- details on how the translocation programme will be implemented; and
- priority being given to implementing mitigation measures in the vicinity of the highway.

The public, community and conservation groups all raised similar issues pertaining to:

- the protection and conservation of *Caladenia huegelii*;
- MRWA failing to demonstrate that *Caladenia huegelii* can be successfully translocated;
- the inadequate compensation/ offset package;
- measures to avoid and minimise impacts (eg reduce footprint);
- the lack of details in relation to translocation methodology; and
- the validity of the LIC process involving the selection of this route option.

Assessment

The area considered for assessment includes:

- additional land related to the Roe Highway Stage 7 corridor that has been reserved under the MRS; and
- the northerly alignment.

The EPA's environmental objective for this factor is to protect Declared Rare and Priority Flora consistent with provisions of the *Wildlife Conservation Act 1950* and the *Environment Protection and Biodiversity Act 1999*.

Given the unavoidable biological impacts associated with the proposed route, the proponent developed a mitigation and offset strategy aimed at avoiding, reducing and compensating the effects of these impacts. In relation to *Caladenia huegelii*, the EPA notes that the offsets proposed include the following:

1. Avoiding and reducing impacts through engineering design modifications to achieve an approximate 7 ha reduction in the extent of native vegetation that will be disturbed and avoidance of approximately 20 *Caladenia huegelii* by adopting the northerly alignment route.
2. Impact reduction measures (operational and management controls) which include conducting additional spring surveys to locate *Caladenia huegelii* and translocation of plants likely to be directly impacted by construction.
3. Environmental offsets to mitigate against unavoidable environmental impacts that may affect the viability of populations of *Caladenia huegelii*. This includes:

- (i) a contribution towards the purchase of Lots 100 and 101 Gay Street Huntingdale (an area of 5.5 ha), or towards securing equivalent natural values, to mitigate the taking of DRF and thereby securing an ‘at risk’ population of *Caladenia huegelii*;
- (ii) contributing to orchid research by BGPA which involves a five year programme of targeted genetic and ecological research to enable successful ex-situ conservation of *Caladenia huegelii* and research into pollinators and symbionts;
- (iii) restoration of degraded areas in road reserve or in adjoining bush areas; and
- (iv) the rationalisation of approximately 27.1 ha of land to be placed into the conservation estate (see Figure 2). Of this land, Offset Area A (4.5 ha), a parcel of land near Fern Leaf Court (adjacent to John Connell Reserve) will be covenanted and the land transferred to a Class A Crown Reserve, vested in the City of Melville and included as part of John Connell Reserve, and thereby protect approximately 20 known plants of *Caladenia huegelii*.

With regard to the mitigation and offset strategy, the EPA supports the purchase of the Huntingdale site by Government on behalf of MRWA and the Public Transit Authority and notes that approximately 20 orchids present on this site will be secured for conservation and that the site provides a suitable habitat for this species.

The EPA notes the Department of Conservation and Land Management’s (CALM’s) advice that if the acquisition of the Huntingdale land does not proceed, then an equivalent area of comparable habitat value would need to be acquired. The EPA is also aware, through advice received from CALM, that consideration was given to the acquisition and conservation of Lot 1582 Harpenden Street to enable a larger conservation reserve to be established. This area is located adjacent to Lot 100, comprises approximately 5.2 ha and contained the original known location of *Caladenia huegelii*. The EPA, however, understands that this block has subsequently been cleared.

Based on the above, the EPA recommends that a condition (Condition 6) be placed on the proponent to ensure Lots 100 and 101 Gay Street Huntingdale are secured for long-term conservation of *Caladenia huegelii* or an equivalent area of comparable ecological value, within 12 months of approval being given to the project. In addition, it is also considered appropriate that the northerly alignment, as approved by the WAPC, be implemented, as this will reduce the impact on the *Caladenia huegelii* population within the reserve.

The EPA recognises the high conservation value of the orchid and notes that the *Caladenia huegelii* population on the highway reserve and in its immediate vicinity is the largest known within the metropolitan area. As such, the EPA supports the rationalisation of land within the vicinity of Roe Highway which will secure the protection of remaining viable populations and habitat in the area and the covenanting

of an area near Fern Leaf Court which will protect a known population of *Caladenia huegelii* that was discovered during surveys of the area in 2003.

Further the offset strategy makes a substantial contribution to genetic and ecological research aimed at ex-situ conservation and propagation of *Caladenia huegelii* and, if successful, will improve the “at risk” status of the species.

The EPA notes that through implementation of the proposal, approximately 74 plants will be directly affected. This number differs from the original number indicated in the PER document due to the adoption of the northerly alignment, and the redesign and adjustment of the road in the vicinity of the landfill.

The EPA is also aware, that in response to community concern, the proponent realigned the PSP from the rear of residential properties to the road shoulder along the northern side of the proposed alignment. However, in the area bounded by Dundee Street and Hollingsworth Way, this would have resulted in an additional 30 plants being directly affected.

Following consideration by the proponent of the environmental and social issues associated with the PSP, the EPA strongly supports MRWA’s decision to realign the PSP to avoid these critically endangered plants. As a consequence, the PSP in the vicinity of Dundee Street and Hollingsworth Way will need to be relocated to the rear of properties, as originally proposed, to avoid these critically endangered plants.

In view of the above, the EPA is also aware that the proponent initially thought fewer plants would be affected by realigning the PSP to the road shoulder, in this area, and hence the proponents response to submissions (Appendix 6) indicates that the total number of *Caladenia huegelii* to be impacted as being approximately 80. This number should be disregarded.

The EPA notes that the proponent has prepared a draft *Caladenia huegelii* Conservation and Management Plan (CCMP) that details procedures to be implemented prior to, during and after construction of Roe Highway Stage 7. This plan was not available for comment during the public review period, and is provided in Appendix 6 for information.

The CCMP outlines procedures for the translocation of orchids and proposed research into *Caladenia huegelii* ecology and genetics (to be partly funded by MRWA). The plan however does not provide a detailed translocation programme as this is envisaged to form part of the research programme to be developed with appropriate technical expertise, prior to translocation of the orchids.

Accordingly, the EPA recommends that a condition (Condition 8) be placed on the proponent to prepare a stand alone *Caladenia huegelii* translocation and monitoring management plan and that this plan be developed in conjunction with CALM and the BGPA.

This plan should:

- establish the baseline health condition of *Caladenia huegelii* prior to translocation;
- establish a methodology to achieve translocation success of at least 50% of plants;

- salvage adult plants directly impacted by the highway extension;
- establish protocols and procedures for monitoring and quantitatively assessing the extent of successful translocation of *Caladenia huegelii*;
- demonstrate that the procedures are appropriate;
- monitor and assess any changes in the health of the *Caladenia huegelii* population following translocation; and
- determine contingency and remedial measures.

It is expected that the translocation and monitoring management plan will take into consideration the Australian Network for Plant Conservation Guidelines for the Translocation of Threatened Flora species and CALM's Policy Statement No. 29 relating to Translocation of Threatened Flora and Fauna.

The EPA notes that the proponent has indicated in its response to submissions that it is willing to involve relevant community and interest groups in the translocation programme under the direction of the relevant research group and that proponent representatives have spoken to a Friends of Ken Hurst Park spokesperson on this matter. Accordingly, the EPA recommends that the translocation and monitoring management plan include community consultation and involvement.

In addition, it is also envisaged that through the review of the translocation plan by CALM and BGPA, that the plan may be able to be expanded to include, for example, monitoring the translocation of adult plants to new habitats incorporating fungal baiting techniques and locating receptive sites.

In relation to translocation, the EPA notes that the orchid survey will be repeated during spring 2004, and that this will determine the number of orchids to be salvaged for translocation. Accordingly, it is also noted that the estimated 74 plants to be impacted on by the proposal may change.

Summary

Based on the above, the EPA considers that the long-term integrity and security of *Caladenia huegelii* will not be significantly compromised provided the mitigation and offset strategy is successfully implemented, including the purchase of the Huntingdale site with extant populations and the rationalisation of land within the road reserve and adjoining bushland including Ken Hurst Park. Further, the EPA considers that there is an opportunity to research the viability of translocation and together coupled with research into *Caladenia huegelii*, a better understanding of the species biology, ecology and genetics can be obtained. On this basis, it is also considered that the proposal will not reduce the viability of the *Caladenia huegelii* populations.

Having particular regard to:

- (a) recommended Environmental Condition 6 in relation to conservation initiatives;
- (b) recommended Environmental Condition 8 pertaining to the *Caladenia huegelii* translocation and monitoring management plan; and
- (c) the proponent's commitments (including implementation of the mitigation and offset strategy);

it is the EPA's opinion that the proposal is capable of being managed to meet the EPA's environmental objective for this factor.

3.2 Biodiversity – impact on flora and fauna

Description

Construction of the highway will result in the clearing of 53.9 ha of undisturbed native vegetation that supports native fauna, including 3.5 ha within Bush Forever site 245 (Ken Hurst Park).

Vegetation and flora survey's undertaken for the proposal identified six vegetation communities. Four of these were Banksia Woodlands with either Allocasuarina or Eucalyptus species as co-dominants, one was a Melaleuca Woodland and one was a heath. Four of the six vegetation types comprised 4 inferred (Gibson et al, 1994) floristic community types (FCTs). The reservation status of those inferred FCTs is regarded as “well reserved” and the conservation status was classed as “low risk” (Gibson et al, 1994).

In addition, apart from the one species of DRF found on site (as discussed above in Section 3.1) one species of priority two flora *Calectasia cyanea* was identified.

Based on the vegetation condition scale (Keighery, 1994) used in Bush Forever Vol 2, the vegetation condition in the southern end of the project area has been classified as ‘pristine’ to ‘excellent’. The rest of the project area is also in an ‘excellent’ condition in the core areas. The native vegetation on the alignment is part of a larger area of bush that encompasses Ken Hurst Park and the Jandakot Airport bushland. The alignment also forms linkages with North and Bibra Lakes to the west and to the south with Acourt and Fraser Road bushland in Banjup though the Jandakot Airport bushland.

Approximately 7.5 ha (14%) of the mapped extent of Bush Forever site 245 (Ken Hurst Park) lies inside the MRS road reserve boundary. On implementation of the northerly alignment, 3.5 ha of this area will be cleared as part of the Roe 7 proposal (MRWA, 2004a). The Bush Forever report specifically acknowledges this encroachment and does not preclude utilisation of the reserve for its designated function (i.e. construction of a regional road).

No systematic survey for fauna was carried out along the highway alignment by MRWA. Accordingly, fauna information is reliant on a considerable body of information on fauna in similar habitats at nearby locations, including Ken Hurst Park (Dell and Cooper, 1992) and the Jandakot Airport bushland (Bamford et al 2003).

Three species of recognised conservation significance have been recorded in the bushland surrounding the highway alignment:

- Western Brush Wallaby (Priority 4);
- Quenda or Southern Brown Bandicoot (Priority 4); and
- Short-billed (Carnaby's) Black Cockatoo (listed as endangered under the *EPBC Act* and as Endangered under Schedule 1 of the *WA Wildlife Conservation Act*).

Other fauna observed in the area include the Rainbow Bee-eater and the Western Grey Kangaroo which has been observed in the area and travels between Ken Hurst Park,

the Melville Glades Golf Course, Jandakot Airport bushland and the old Melville rubbish tip.

Submissions

Key comments made in submissions focused on:

- MRWA’s poor track record for revegetation and rehabilitation of road reserves in the metropolitan area;
- minimum restoration and revegetation requirements;
- dieback and weed management;
- maintaining the bushland corridor for fauna use;
- the need for all infrastructure to be pegged before clearing to see if any trees or vegetated areas located between pathways, drainage areas and road surface areas can be retained;
- monitoring;
- the value of rehabilitation in offsetting the loss of native vegetation;
- inadequate understanding of the dynamics of fauna populations in the area;
- fauna movement and relocation;
- loss of feeding habitat for the Carnaby’s Black Cockatoo;
- support for the transfer of all uncleared portions of the highway reserve into Ken Hurst Park;
- management of all vegetation directly and indirectly affected by the construction of the highway, including any vegetation outside of the highway reserve at risk from the construction;
- the replacement of equivalent bushland area with similar values;
- loss of environment values should be offset by MRWA through the purchase of bushland with equivalent conservation value for inclusion into the conservation estate;
- realignment of the highway to avoid impact on Ken Hurst Park;
- the importance of Bush Forever site 245 in terms of its vegetation, as a fauna refuge and as part of a larger linkage system; and
- priority should be given to mitigation measures in the vicinity of the highway.

Assessment

The area considered for assessment is the Roe Highway Stage 7 corridor that has been reserved under the MRS and the northerly alignment.

The EPA’s environmental objectives for this issue are:

Issue	EPA Objectives
Biodiversity	<ul style="list-style-type: none"> • Maintain the abundance, species diversity, geographic distribution and productivity of terrestrial flora and fauna; • Ensure that regionally significant flora and vegetation communities in Bush Forever sites are adequately protected; and • Protect Specially Protected (Threatened) Fauna consistent with provisions of the <i>Wildlife Conservation Act 1950</i>.

With regard to vegetation the EPA notes that the Banksia woodland which is the predominant vegetation found on the alignment occurs in Bush Forever sites south

and north of the river and is considered to be well reserved. The EPA also notes that no species of flora will be lost, and the overall geographic distribution of the vegetation types will not be significantly altered due to the large areas of similar vegetation remaining in the immediate vicinity of the project.

As detailed in section 2 of this report, the proponent has developed a mitigation and offset strategy to reduce environmental impacts through design modifications, operational and management controls and through environmental offsets.

As part of design modifications, the EPA notes that MRWA has reviewed its existing standards and that as a result the extent of native vegetation clearing has been reduced by 7 ha. This has been achieved through:

- reducing the median width between South Street and John Connell over a distance of approximately 1300m;
- relocating the PSP adjacent to the road shoulder, with the exception of the area bounded by Dundee Street and Hollingsworth Way, and thereby reducing habitat fragmentation;
- stockpiling materials outside the road reserve to minimise disturbance to native vegetation;
- adoption of the northern alignment for the portion of highway south of John Connell Reserve; and
- retaining vegetation in areas proposed for infiltration of stormwater runoff, and revegetating infiltration basins using dampland species of local provenance. Once established it is envisaged that these areas should provide similar ecosystem functions to those of naturally occurring damplands.

The EPA also notes that MRWA has committed to landscaping approximately 30 ha of the land disturbed during highway construction which includes establishment of 6,000 Banksias (of local species and local provenance) which when mature could provide food to support a population of approximately 25 Carnaby's Cockatoos, and restoring approximately 5 ha of degraded areas in the road reserve or in adjoining bush areas. This will assist in mitigating the loss of native vegetation resulting from route construction.

Despite the design modifications and impact reduction measures, Roe Highway Stage 7 will result in some unavoidable environmental impacts. In recognition of this MRWA developed a strategy to compensate unavoidable impacts that may affect, amongst other aspects:

- the extent, quality, connectivity and level of protection of remnant Banksia woodland; and
- the extent, quality and level of protection used for feeding by Carnaby's Black Cockatoos.

The strategy adopted a risk-based approach to offsets. Table 2 presents a summary of offsets to address unavoidable project impacts.

Table 3: Summary of offsets to address unavoidable impacts

Element	Area	Offset	Benefits
Land Rationalisation	Area A	Place covenant approximately 4.5 ha of land near Fern Leaf Court and place into conservation estate. Transfer land from Commissioner for Main Roads to a Class A Crown Reserve, vested in the City of Melville, and included as part of John Connell Reserve. <ul style="list-style-type: none"> Land is not currently included in Bush Forever site. Current zoning is “Parks and Recreation” Bandicoots (quenda) reported to occur in area. 	<p>DRF offset:</p> <ul style="list-style-type: none"> Protects known population of approximately 20 <i>Caladenia huegelii</i>. <p>Habitat offset:</p> <ul style="list-style-type: none"> Preserves good quality habitat for quendas and other small animals currently residing in the area. Protects Banksia woodland used for feeding by Carnaby’s Cockatoos. <p>Remnant vegetation:</p> <ul style="list-style-type: none"> Provides publicly accessible area of good quality vegetation for nature study and enjoyment by local residents.
	Area B	Land rationalisation to allow approximately 4.7 ha of land south of Roe 7 to be incorporated into Ken Hurst Park. Transfer ownership to a Class A Crown Reserve to be managed as part of Ken Hurst Park..	<p>Habitat/ remnant vegetation offset:</p> <ul style="list-style-type: none"> Increases area of good quality remnant vegetation within Bush Forever site. Fencing provided by MRWA will help control access to protected bushland, reducing damage from trail bikes, motor vehicles etc.
	Area C	Land rationalisation of approximately 6.3 ha of land (located to the northwest of Marriot Road, north of the railway line) owned by the Commissioner of Main Roads to allow incorporation into Ken Hurst Park. Transfer ownership to a Class A Crown Reserve to be managed as part of Ken Hurst Park.	<p>Habitat/ remnant vegetation offset:</p> <ul style="list-style-type: none"> Increases area of good quality remnant vegetation within Bush Forever site. Helps maintain east-west bush corridor. Preserves good quality Banksia woodland used for feeding by Carnaby’s Cockatoos
	Area D	Land rationalisation and covenanting approximately 6.5 ha of land (immediately south of the Kwinana interchange area) owned by the Commissioner of Main Roads and land owned or vested in Western Power or transfer to Crown land vested in an appropriate management agency.	<p>Habitat/ Remnant vegetation offset:</p> <ul style="list-style-type: none"> Increases area of good quality remnant vegetation managed for conservation purposes. Preserves good quality Banksia woodland (feeding habitat for Carnaby’s cockatoos).
	Area E	Covenant approximately 5.1 ha of remnant bushland in the vicinity of the Roe 7/ Kwinana Freeway interchange. Land owned by Commissioner for Main Roads and Crown Land.	<p>Habitat/ Remnant vegetation offset:</p> <ul style="list-style-type: none"> Increases area of good quality remnant vegetation managed for conservation purposes. Preserves good quality Banksia woodland (feeding habitat for Carnaby’s Cockatoo).
Funding	Ken Hurst Park	Matching funding to City of Melville for implementation of Ken Hurst Park Management Plan.	<p>Remnant vegetation offset</p> <p>Supports protection of near pristine remnant vegetation, including DRF, by providing funds to allow fencing of the park, limiting access to designated paths, providing dieback control and weed control etc. Consistent with the established park management plan (Sept 2003).</p>

Element	Area	Offset	Benefits
	Degraded areas	Restoration of degraded areas in road reserve or in adjoining bush areas.	Remnant vegetation offset Allows revegetation and other restoration works to improve the condition of approximately 5 ha of bush in proximity to Roe Highway Stage 7.
Connectivity	Ken Hurst Park	Provision of connectivity to Ken Hurst Park through either contribution to upgrade of access track sunning parallel to rail services road (between Karel Ave and Banister Road) or pedestrian underpass.	Connectivity offset Improves access to Ken Hurst Park for bush maintenance and fire fighting, thereby reducing the risk of vegetation decline.
Education initiatives	General	In kind support to City of Melville for use in Perth Biodiversity Initiatives	DRF/ Remnant vegetation offset Helps raise local awareness of the value of native vegetation and DRF. Provides support for protection of locally significant vegetation.

As outlined above, MRWA has sought to protect and enhance remnant bushland in the vicinity of the project area through conservation covenants and placing areas into the conservation estate. This is considered to offer the best opportunity for preserving ecological integrity and biodiversity as it will result in a large extent of contiguous bushland, provide better connectivity for fauna movements, and reduce the chance of habitat decline through edge effects.

It is also recognised that these offsets must be protected with covenants or legal agreements to ensure the positive environmental benefit is long-lasting. Hence the EPA recommends that the proponent, as part of Condition 6, demonstrate to the EPA within two years of approval how the mitigation and offset strategy has been implemented.

Land Rationalisation Areas

Through the rationalisation of land within the reserve and bushland adjoining the reserve, the EPA notes that good quality habitat used for feeding by Carnaby's cockatoos and other small fauna will be provided.

The EPA also notes that MRWA proposes to establish conservation covenants over approximately 16 ha of land (Offset Areas A, D and E), and to implement actions to facilitate the conservation management of residual areas of native vegetation in the vicinity of the Roe 7 reserve including approximately 11 ha (Area B and Offset Area C) that will see ownership transferred to a Class A Crown Reserve to be managed as part of Ken Hurst Park. It is also noted that Area A will be transferred to a Class A Crown Reserve, vested in the City of Melville and included as part of John Connell Reserve and that Area D may be covenanted or transferred to Crown Land vested in an appropriate management agency to ensure the most effective mechanism for conservation of that area.

The EPA also notes that the proponent has made a commitment to develop and implement management plans for these areas until they are appropriately transferred.

The EPA supports the inclusion of the above areas into the conservation estate and makes the following comments on their inclusion.

i) Area B – Ken Hurst Park

It is the EPA's view that Area B should not be considered as a proponent offset as this area has already been identified as Bush Forever site 245. The EPA, is aware that the Bush Forever report indicates that encroachment of a Bush Forever site upon a Regional Road Reserve does not preclude utilisation of the reserve for its designated function. However, Appendix 3 of the Bush Forever Site Implementation Guidelines Practice Notes states that "where no feasible alternative exists for a revision of the road/railway reserves, the responsible authority or the local government in consultation with other government agencies, will seek to ensure that the future design and management of the road/railway reserve will minimise the impact on areas recommended for protection" (Government of Western Australia, 2000).

Incorporation of this area into Ken Hurst Park (Bush Forever site 245) will protect this area in accordance with the intent of this recommendation. Therefore this does not represent an offset for the impacts of the proposal, although it does meet MRWA's obligations to implement this section of Bush Forever Site 245 as part of the proposal.

Based on the above, it is expected that residual bushland area within the road reserve will be conserved/ protected as an outcome of the proposal and that all areas set aside as offsets would be intended to be secured for the long-term and that this applies equally to the Bush Forever Site and other offsets.

ii) Offset Area D and E

The EPA notes that the addition of Offset Areas D and E into the conservation estate will establish the foundation of a designated greenway area between Ken Hurst Park, Jandakot bushland, Beeliar Regional Park and the Bibra Lake area. It is also noted, however, that a number of drainage features will be required within the Kwinana interchange area and that MRWA has committed to managing the remnant interchange Banksia woodland area for conservation.

With regard to Area D, the EPA suggests that consideration should be given to extending this parcel of land to include other remnant bushland in the road reserve of conservation value.

In terms of Offset Area E (land to the north east of the interchange), it is noted that the elongated linear extremities of Main Roads' land holdings have been excluded, to facilitate management of the area. It is considered, however, that this surplus land be managed for conservation rather than for any other purpose.

Carnaby's Black Cockatoo and other fauna

The EPA is aware that a review was undertaken by Johnstone et al (2003) to assess the significance of the proposed highway as a feeding site for Carnaby's Cockatoos. In undertaking this review, Johnstone observed that:

- the proposal area is regularly used for feeding by Carnaby's Cockatoo;
- cockatoos have been observed feeding on flowering and seeding Banksia, Eucalyptus, on Pinus cones in the western Hope Road Section, in suburban

gardens and nut trees, and on weeds in an old recycling area adjacent to John Connell Reserve;

- numbers of birds are highest during the non-breeding season (summer-autumn); and
- no roosting sites were recorded.

The review concluded that the loss of some native vegetation along the proposed Roe Highway Stage 7 extension would not have a significant impact on the overall feeding area used by the cockatoos, and that the main potential impact would result from bird strikes by fast moving traffic.

The key recommendations arising from the report were:

- i) existing native vegetation should be retained as much as possible;
- ii) existing native vegetation remnants (for example Ken Hurst Park) should be preserved and increased where possible;
- iii) verge areas should be buffered with tall trees to prevent bird strikes; and
- iv) possible enhancement and revegetation of the old recycling centre west of John Connell Reserve (using seed stock from Ken Hurst Park) to provide future food resources for cockatoos.

The EPA notes that the proponent has committed to progressive replacement of 6000 Banksia trees (of local species and local provenance) through project landscaping involving direct seeding, tube stock and recruitment from the seed bank contained in re-spread topsoil. It is also noted that the Banksias will be re-established within an area of approximately 12.5 ha, mostly along the road formation. The set-back distance of the Banksias will depend on slope of the ground adjacent to the highway and will be discussed with a specialist zoologist familiar with flight patterns (MRWA, 2004b). Further, other trees known to provide food to Carnaby's Cockatoo (eg Marri) are also proposed to be planted in rehabilitation areas such as John Connell Reserve and high fences (1.8m) will be constructed in close proximity to the highway to encourage Cockatoos to fly high when near the highway.

Based on the proponents commitments and the mitigation and offset strategy as detailed above, the EPA concurs that the loss of some native vegetation along the proposed Roe Highway Stage extension would not have a significant impact on the overall feeding area used by the cockatoos. Further, it is noted that visiting flocks to the area have been recorded at being between 10 and over 100 individuals and when this is compared to records of flocks of over 9000 birds in the Gnanagara pine plantations north of Perth (Mitchell, 2003), the loss of vegetation with the Roe 7 alignment cannot be considered to be critical to the survival of the species.

The EPA considers that through landscaping, rehabilitation and land rationalisation, an appropriate food source can be maintained for the Carnaby Cockatoos utilising the area.

With regard to other fauna the EPA notes that, although the Rainbow Bee-eater has been recorded in the vicinity of the proposed site, there is no habitat suitable for breeding on the actual site alignment (MRWA, 2004a). The EPA also notes that in order to prevent degradation of vegetation and elevated populations of kangaroos in

bushland remnants the proponent will not be providing an underpass for larger fauna on the Roe 7 project.

Revegetation

In relation to revegetation, it is noted that community and conservation groups expressed the view that MRWA has a poor track record for revegetation and rehabilitation of road reserves in the metropolitan area and that minimum restoration and revegetation requirements needed to be addressed (refer to Appendix 1 and 6).

Given the need to achieve effective rehabilitation to maintain habitat for fauna, the EPA recommends that a condition (Condition 7) be placed on the proponent to prepare and implement a Rehabilitation Plan to provide a framework to ensure that the site is left in an environmentally acceptable condition. This plan should be made publicly available for a two week public comment period and address:

- minimum restoration and revegetation requirements;
- completion criteria;
- a rehabilitation schedule including timing;
- monitoring, management and remedial actions; and
- community involvement.

Given the recommendation made by Johnstone et al (2003) in relation to revegetating the old recycling centre, it is suggested that the proponent consult with the City of Melville and relevant land managers when developing the plan to determine whether this is a viable proposition.

Environmental Commitments

With regard to the proposal, the EPA notes that the proponent has committed to preparing and implementing the following management plans:

1. A Vegetation Management Plan to minimise the extent of clearing required for the project and to mitigate for the loss of significant vegetation. The plan will be provided to CALM for review and address:
 - clearing boundaries;
 - procedures for the removal, handling and storage of vegetation and topsoil;
 - dieback hygiene requirements;
 - stripping, management and reuse of topsoil;
 - selective harvesting of site won material in order to avoid the spread of weedy species;
 - site preparation activities; and
 - revegetation (including timing, success criteria, management and monitoring).

In addition, the EPA notes that the Vegetation Management Plan, as indicated in the proponents response to submissions, will include the identification and mapping of weed infected area; eradication of high risk weeds through selective spraying and removal; using topsoil from degraded weed infested areas as fill for bridge abutments and thereby preventing weed germination; monitoring and

remediation of weed infestations along the alignment, revegetated areas and remnant vegetation in the road reserve; and contributing \$10,000 to the City of Melville as matching funding for use in weed control measures in Ken Hurst Park.

The EPA also notes that the proponent in its response to submissions has indicated that where practicable, native plants which represent a significant structural component (such as Balgas, Zamias and Christmas Trees) will be salvaged prior to clearing for use in site rehabilitation and that the opportunity for community involvement is being investigated.

2. A Pest and Disease Management plan to address dieback (clean down and hygiene requirements, treatment of small areas of infection, disposal of infected material, dieback management measures) which will be reviewed by CALM prior to implementation.
3. A Fauna Management Plan to minimise impacts on threatened fauna species and to ensure effective management of kangaroos affected by the project. The plan will address all issues associated with design and construction, as they pertain to the protection of local fauna, and to mitigation of impacts on local fauna populations such as:
 - the link between the Fauna Management Plan and the Vegetation Management Plan;
 - fauna food plants to be incorporated into revegetation;
 - design of fauna underpasses to compensate for fragmentation of habitat and maintain fauna distribution;
 - trapping and relocation of Quenda; and
 - management and monitoring requirements for kangaroos and fauna fencing.

As indicated in the proponent's response to submissions (MRWA, 2004b) it is also noted that the Fauna Management Plan will address all species of conservation significance (known to occur or that may potentially occur) in order to mitigate the potential for impact on these species (including trapping/relocations, provision of underpasses, fencing etc). Initiatives to address the potential impact on native fauna will also include:

- minimising the extent of habitat loss through route re-design;
- introduction of effective control over construction activities to minimise risk of over-clearing through the Vegetation Management Plan;
- installation of underpasses to maintain connectivity for small fauna;
- fencing of the proposed route to reduce the risk of road kills;
- utilisation of amber lighting to avoid attraction of nocturnal wildlife to the proposed route; and
- permanently segregating Western Grey Kangaroos to the north and south of the highway.

In addition to the above, it should also be noted that since preparation of the PER, the possibility that the proposed route could affect wetland areas was investigated by

three independent wetland experts. As a result a more thorough analysis of vegetation data resulted in the re-assignment of vegetation assemblages to floristic units that are typical of woodlands and not dampland. A field survey carried out to check for wetland vegetation failed to identify any wetlands along the route. Accordingly, commitments made in the PER in relation to wetland management are now redundant.

Summary

The EPA notes that the proponent has committed to implementing actions to facilitate the conservation management of residual areas of native vegetation in the vicinity of the Roe Highway Stage 7 reserve and through this process, an area of approximately 11 ha will become available for addition to Ken Hurst Park. The proponent has also committed to rehabilitation areas totalling 5 ha within the MRS that will either be disturbed as a result of construction or are already disturbed. In addition, a number of management and mitigation measures will be implemented during and after construction to ensure the quality of remaining bush land adjoining the highway is not adversely affected as a result of construction.

The EPA considers that the loss of some native vegetation along the proposed Roe Highway extension will not have a significant impact on the overall feeding area used by the Carnaby's Cockatoos and that the range of management measures to be implemented as part of construction and operation of the proposed highway will minimise impacts on fauna and fauna habitats.

Having particular regard to the:

- (a) the proponent's commitments (including implementation of the mitigation and offset strategy); and
- (b) recommended condition 7 in relation to rehabilitation;

it is the EPA's opinion that the proposal is capable of being managed to meet the EPA's environmental objective for this factor

3.3 Noise

Description

Construction and traffic on the highway will alter the noise environment for the residential community closest to the highway.

Submissions

The main comments raised in submissions focused on:

- placement of sound attenuation barriers;
- increased noise and vibration;
- the need for a minimum 25m distance between the route and adjacent residential areas;
- failure to establish baseline noise levels;
- relocation of noise walls from the rear of property boundaries to the carriageway;
- hours of operation;
- noise modelling; and

- the installation of noise walls on, or adjacent to, the road reserve boundary so that they may also function as security walls (City of Melville).

In response to the independent noise assessment review undertaken for the project by Lloyd Acoustics (March 2004) (Appendix 6) the Department of Environment (DoE) made a number of comments. These comments focused on:

- the need to extend a noise barrier eastwards at a location in Evergreen Ct (Lot 15) to ensure noise criteria are not exceeded;
- the need for a review of barrier design and noise barrier adjustments in two locations to ensure noise criteria are not exceeded;
- an error in relation to a noise barrier height alongside Karel Avenue that should have read 2.4 metres high;
- barriers being built of masonry construction, or alternatively they should demonstrate that a transmission loss of 25 dB(A) can be achieved;
- the need for the proponent to review the barrier design for residences alongside Woodleas Cst, Brandwood Gdn and Evergreen Ct to enable possible improvements to the barrier design; and
- the need for the proponent to model the northern alignment to confirm that the effect of implementing the northern alignment on noise would be negligible.

Assessment

The area considered for assessment of this factor is the proposed Roe 7 alignment from South Street to Kwinana Freeway and immediate adjacent areas.

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

The EPA notes that the independent review (Lloyd, 2004) verified that the methodology, assumptions and calculations used to design the noise barriers for the proposal are reasonable and that the noise sensitive receivers adjacent to the highway are likely to receive noise levels below the criteria with the proposed noise barriers.

It is also noted that an independent calculation was undertaken at 25 locations, representative of the changing conditions along the proposed road alignment, and that the noise barriers proposed in the design would result in noise level objectives being achieved at all but one location. Traffic noise calculations were also undertaken at the selected noise sensitive premises with an adjusted source height for heavy vehicles. The results showed that an increase in predicted noise levels of between 0.2 and 2.0 dB(A) could be expected and that in all but two locations the proposed noise barriers complied with noise level objectives.

In response to the independent review and community concerns (MRWA, 2004b), the EPA notes that:

- MRWA has indicated that noise walling will be extended to address Evergreen Ct (Lot 15);

- the proponent has acknowledged the error made in relation to the height of the noise wall;
- noise barriers will be constructed from precast concrete panels, although other types of construction are being investigated and that in the event that other materials are proposed their suitability will be confirmed with DoE;
- where walls will be installed on the property boundary, residents will be consulted regarding the colour and patterning of the walls;
- installation of the walls will incorporate reinstatement of any disturbance to the adjoining property, including gardens;
- where the proposed route adjoins residential properties, the intention is to position noise walls adjacent to the carriageway where possible. Although the specific location of the noise walls will not be known until detailed design has been completed, a minimum separation distance of 20 m to the operating lane can be achieved; and
- during the detailed design stage:
 - further noise modelling will be undertaken to more accurately determine the location and size of noise walls and final heights of walls;
 - the most appropriate methodology for noise abatement will be undertaken;
 - a thorough review of noise wall sizes and locations will be undertaken and that individual consultation with residents during the detailed design phase will help determine whether increasing wall heights to further decrease noise is more preferable in lieu of attempting to minimise the impact of the wall; and
 - further noise modelling will more accurately determine the location and size of noise walls and that this will include the selected alignment (north or south).

The EPA further notes that through engineering design modifications (as detailed in the mitigation and offset strategy (Appendix 6) impacts on residential amenity will be reduced and more effective noise control will be achieved by allowing noise barriers to be located closer to the noise source.

The proponent has also committed to preparing and implementing a noise and vibration management plan (as part of the construction EMP). The objective of this plan is to ensure that the amenity of adjacent residential areas is not significantly impacted by either noise or vibration from construction of the highway. It is the EPA's expectation that the proponent will address those issues raised above in this plan as well as management strategies to minimise noise and vibration, procedures for public complaints, and hours of operation.

It is also noted that where out of hours work is unavoidable, a specific out of hours noise management plan is required to be submitted to the relevant Local Government Chief Executive Officer (CEO) at least seven days before the work starts, and that this plan must be approved by the CEO. The noise management plan will include details of the need for the work to be carried out of hours, predictions of noise levels, types of activity that could be noisy, control measures for noise and vibration, monitoring of noise and vibration and complaint response.

In addition to this, the proponent is also required to submit a Regulation 13 application in respect to the management of construction noise under the *Environment Protection (Noise) Regulations 1997*.

Further, MRWA has committed to:

- ensuring that ambient noise levels at all residential or other noise sensitive premises adjacent to the alignment do not exceed the base level criteria of 63dB(A) for day time noise and 55 db(A) for night time noise through provision of a range of noise attenuation barriers; and
- identifying a “best practice” approach to traffic noise mitigation in consultation with the DoE and implementing this.

Summary

Having particular regard to:

- (a) proponent compliance with the *Environmental Protection Noise Regulations 1997*, including Regulation 13;
- (b) the independent review of noise impact assessments; and
- (c) the proponent’s commitments,

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

4. Conditions and Commitments

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

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

The EPA recognises that not all of the commitments are written in a form 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 Proponent’s commitments

The proponent’s commitments as set in the PER and subsequently modified, as shown in Appendix 5, should be made enforceable. These commitments form Schedule 2 and Schedule 3 of the Statement.

4.2 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Main Roads Western Australia to extend Roe Highway from South Street in Canning Vale to Kwinana Freeway in Leeming, is approved for implementation.

These conditions are presented in Appendix 5. Matters addressed in the conditions include the following:

- (a) that the proponent fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 5;
- (b) the acquisition of the Huntingdale land or an equivalent area of comparable ecological value within 12 months following the issuing of the notice under S45(7) of the *Environmental Protection Act 1986*;
- (c) implementation of the northerly alignment, as approved by the Western Australian Planning Commission on 15 April 2004, within 18 months of the issuing of the notice under S45(7) of the *Environmental Protection Act 1986*;
- (d) demonstration within 18 months following the issuing of the notice under S45(7) of the *Environmental Protection Act 1986*, that the mitigation and offset strategy has been adequately implemented;
- (e) the preparation and implementation of a rehabilitation plan; and
- (f) the preparation and implementation of a *Caladenia huegelii* translocation and monitoring management plan.

It should be noted that other regulatory mechanisms relevant to the proposal includes approval by the Minister for the Environment under *the Wildlife Conservation Act 1950* in relation to DRF.

5. Other Advice

Roe Highway Stage 7 Alignment

The EPA notes that many submissions raised issues relating to the justification of the proposed Roe Highway Stage 7, including the consideration of alternative alignment options.

The EPA understands that Roe Highway formed part of the regional road network that was included in the MRS in 1963, and that Metroplan (1990), the Road Reserves Review (1991), the Metropolitan Transport Strategy (1995) and the Metropolitan Land Transport Directions for WA (2000) confirmed that Roe Highway would provide benefits by:

- linking industrial areas in the southern and eastern areas of the Perth metropolitan areas;
- linking the Port of Fremantle with major industrial areas within the Perth metropolitan area and to major gateways to the Perth Metropolitan area;

- providing cross suburban connection between the Kwinana Freeway and South Street/ Ranford Road, Albany Highway and Tonkin Highway; and
- reducing the movement of heavy vehicles and regional traffic flows on other routes (MRWA, 2004b).

It is also understood that the alignment for this section of Roe Highway has previously been part of extensive discussions and consultation through the Metropolitan FNR, and that the review confirmed the need for a connection between the end of Roe Highway Stage 6 at South Street and Kwinana Freeway as a key element in sharing the freight and general vehicle traffic load with other arterial roads in the area and in ensuring efficient freight access to the Kwinana Industrial Area and future port facilities (DPI, 2003).

Following the completion of the FNR, the Minister for Planning and Infrastructure established a LIC to consider the implications of freight movement in the southwest metropolitan area and to recommend a final alignment for Stage 7.

Public consultation and a value management assessment were undertaken by the LIC in its consideration of six alignment options and a multi-criteria analysis was used to assess and rank the six options against environmental, social and economic criteria. Option A, which follows the current MRS alignment, was the highest ranked alignment option at the completion of the value management process based on non-cost evaluation criteria and after cost was taken into account.

The EPA notes that Option A was considered to have the least impact on the Bush Forever site that contains Ken Hurst Park, on private and Government property and on groundwater priority protection areas. Option A was also considered the best option in terms of social equity and allowed the project to be completed within the shortest practical timeframe. All options, including Option A, assessed impact on DRF and it was acknowledged that significant work required during design and construction would be needed to minimise these impacts in addition to noise and vibration impacts (DPI, 2003).

The Minister for Planning and Infrastructure endorsed the preferred option, and this option was referred to the EPA for assessment by MRWA.

The EPA notes that the Kwinana Freeway/ Roe Highway interchange has been designed consistent with the outcomes of the FNR and that the design makes no provision for a westward extension (i.e. Roe 8) in accordance with Government's decision not to construct Stage 8 of the Roe Highway. This is consistent with earlier advice of the EPA (EPA, 2003).

6. Conclusions

The EPA has considered the proposal by MRWA to extend Roe Highway from South Street in Canning Vale to Kwinana Freeway in Leeming. This alignment incorporates the proposed northerly alignment as approved by the Western Australian Planning Commission (WAPC).

The total footprint of the project area encompasses 62 hectares (ha) of which 53.9 ha will be cleared. The proposed highway passes through an area between Ken Hurst Park and John Connell Reserve that contains a species of Declared Rare Flora (DRF), the Grand Spider Orchid, *Caladenia huegelii*.

Through implementation of the proposal, approximately 74 plants will be directly affected. This number differs from the original 86 indicated in the PER document due to the adoption of the northerly alignment in order to avoid 20 and the redesign of the road in the vicinity of the landfill.

The EPA is aware that in response to community concerns the proponent realigned the Principal Shared Path (PSP) from the rear of residential properties to the road shoulder along the northern side of the alignment. However, in the area bounded by Dundee Street and Hollingsworth Way this would have led to an additional 30 plants being directly affected. Following consideration by the proponent of the environmental and social issues associated with the realignment of the PSP, the EPA strongly supports MRWA's decision to realign the PSP in this area to avoid these plants.

As a consequence, the EPA notes that the PSP in the area bounded by Dundee Street and Hollingsworth Way will need to be relocated to the rear of properties, as originally proposed, to avoid these critically endangered plants.

Subsequent to the release of the Public Environmental Review (PER) document, the proponent has developed a Mitigation and Offset Strategy to avoid, reduce and compensate the unavoidable biological impacts associated with the proposal.

The key aspects of the mitigation and offsets strategy include:

- (i) avoiding and reducing impacts through engineering design modifications which will lead to a 7 ha reduction in the area impacted and avoidance of approximately 20 *Caladenia huegelii* plants by adopting the northerly alignment route;
- (ii) impact reduction measures (operational and management controls) that will see amongst other things the maintenance of habitat through rehabilitation of disturbed land and fauna management; and
- (iii) environmental offsets to compensate unavoidable impacts that may affect:
 - the viability of populations of *Caladenia huegelii*;
 - the extent, quality, connectivity and level of protection of remnant Banksia woodland;
 - the access of local residents and other s to areas of natural bush; and
 - the extent, quality and level of protection of habitat used for feeding by Carnaby's Black Cockatoos.

The EPA notes that the combined offsets provide for:

- securing approximately 16 ha of high quality remnant Banksia woodland, including land known to contain *Caladenia huegelii*, by placing this land into the conservation estate;
- securing an additional 11 ha of land to be incorporated into the conservation estate (Ken Hurst Park); and

- restoration of approximately 5 ha of degraded bush in the project area.

The EPA considers that any 'surplus' land to that identified in the mitigation and offset strategy and for the construction of the highway should be secured for conservation rather than being set aside or disposed of for other purposes.

The offset strategy also:

- provides for a contribution towards the purchase of a parcel of land at Gay Street Huntingdale or an equivalent area to secure an 'at risk' population of *Caladenia huegelii*; and
- makes a substantial contribution to genetic and ecological research aimed at ex-situ conservation and propagation of *Caladenia huegelii*, and if successful, will improve the 'at risk' status of the species.

The EPA considers that the protection and enhancement of remnant bushland in the vicinity of the project area through conservation covenants and placing areas into the conservation estate is considered to offer the best opportunity for preserving ecological integrity and biodiversity as it will result in a large extent of contiguous bushland being protected, provide better connectivity for fauna habitats, and reduce the chance of habitat decline through edge effects.

The EPA is aware that techniques for translocation of *Caladenia huegelii* have not been successfully demonstrated and hence information regarding translocation is limited. Accordingly, the EPA recommends that the proponent prepare a *Caladenia huegelii* translocation and monitoring management plan and that this be developed in conjunction with the Department of Conservation and Land Management and the Kings Park Botanic Garden and Parks Authority.

In addition, to assist in ensuring that reasonable revegetation expectations are met, the EPA recommends that the proponent prepare a detailed Rehabilitation Plan detailing restoration and management measures, a rehabilitation schedule and community consultation and involvement.

With regard to fauna, the EPA considers that the loss of some native vegetation along the proposed Roe Highway extension will not have a significant impact on the overall feeding area used by the Carnaby's Cockatoos and that the range of management measures to be implemented as part construction and operation of the proposed highway will minimise impacts on fauna and fauna habitats.

In relation to noise, the EPA notes that construction and traffic on the highway will alter the noise environment for the residential community closest to the highway. The EPA notes that an independent review of the noise impact assessment concluded that the methodology, assumptions and calculations used to design the noise barriers for the proposal are reasonable and that the noise sensitive receivers adjacent to the highway are likely to receive noise levels below the MRWA criteria of 63dB(A) for day time noise and 55 db(A) for night time noise through the provision of a range of noise attenuation criteria.

The EPA has concluded that the proposal may be implemented subject to:

- (a) implementation of the northerly alignment, approved by the WAPC on 15 April 2004, within 18 months;
- (b) the acquisition of the Huntingdale land or an equivalent area of comparable ecological value within 12 months;
- (c) implementation of the mitigation and offset strategy;
- (d) demonstration within 18 months that the mitigation and offset strategy has been fully implemented; and
- (e) implementation of the proponent's commitments.

The EPA notes that many submissions raised issues relating to the justification of the proposed highway, including the consideration of alternative alignment options. The EPA acknowledges the process that was used in determining the alignment for the Roe 7 corridor and notes that the highest ranked alignment option was subsequently accepted by the State Government. The EPA, however, can only assess the proposal as presented to it by the proponent.

The EPA notes that the Kwinana Freeway/ Roe Highway interchange has been designed consistent with the outcomes of the Freight Network Review and that this makes no provision for a westward extension (i.e. Roe 8) in accordance with Government's decision not to construct Stage 8 of the Roe Highway.

The EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of their commitments and the recommended conditions set out in Appendix 5 and summarised in Section 4.

7. Recommendations

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

1. That the Minister notes that the proposal being assessed is for the extension of Roe Highway (Stage 7) from South Street in Canning Vale to Kwinana Freeway in Leeming;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 5, and summarised in Section 3, including the proponent's commitments; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 5 of this report.

Appendix 1

References

- Air Assessments (March 2004) *Roe Highway - Stage 7 – Independent Review of Air Quality Impact Assessment*, Perth.
- Air Assessments (April 2004) *Roe Highway – Stage 7 Regional Air Quality Study* Prepared for Roe 7 Alliance, Perth.
- Bamford, M.J.; Saffer, V. and Wilcox, J. (2003) *Fauna Survey of Jandakot Airport 2002 Final Report*. Unpublished report fro Jandakot Airport Holdings Pty Ltd.
- Gibson, N, Keighery, B; Keighery, G; Burbidge, A, and Lyons, A (1994) *A Floristic Survey of the Southern Swan Coastal Plain*. Department of Conservation and Land Management, Perth.
- Dell J. and Cooper N.K (1992) *Vertebrate Fauna of Ken Hurst Park, City of Melville*. Unpublished Report for the City of Melville.
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- Department for Planning and Infrastructure, (January 2003) *Roe Highway Stage 7 Alignment Selection Summary Report*, prepared by the Department for Planning and Infrastructure on behalf of the Local Impacts Committee (Term of Reference 1), Perth.
- Environmental Protection Authority (February 2003) *Environmental Values Associated with the Alignment of Roe Highway (Stage 8)* A report by the Environmental Protection Authority under Section 16(j) of the *Environmental Protection Act 1986*, Bulletin 1088, Perth Western Australia.
- Gibson N; Keighery, B.; Keighery G; Burbidge, A. and Lyons, M (1994) *A Floristic Survey of the southern Swan Coastal Plain*. Unpublished Report for the Australian Heritage Commission prepared by the Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc).
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- Johnstone, R.E and Johnstone, C (2003) *Review of Carnaby's Cockatoo *Calyptorhynchus latirostris* within the proposed Roe Highway Stage 7 Area, Jandakot*.
- Lloyd Acoustics (March 2004) *Traffic Noise Assessment Roe Highway Stage 7 Project, Independent Review of Noise Impact Assessments* prepared for Roe 7 Alliance.
- Main Roads Western Australia - Roe 7 Alliance (2004a) *Roe Highway Stage 7 Extension (South Street To Kwinana Freeway), Public Environmental Review, Assessment Number 1466*, Perth

Main Roads Western Australia (2004b) *Roe Highway Stage 7 Extension (South Street Kwinana Freeway), Report on Issues From Submissions and Response to Issues*, Perth.

Roe 7 Alliance (2004) Draft *Caladenia huegelii* Conservation and Management Plan, Perth

Appendix 2

List of Submitters

Organisations:

Government

City of Melville
Department of Conservation and Land Management
Department of the Environment and Heritage (Commonwealth)
Department of Environment – Air Quality Management Branch, Ecological Systems
Branch, Land and Water Quality Branch and Swan Goldfields Region
Heritage Council of Western Australia

Community groups

Beeliar Conservation and Heritage Council
Conservation Council of Western Australia Inc
Friends of Ken Hurst Park
Melville Conservation Group (including a petition with 556 signatures)
North Lake Residents Association Inc
Wetlands Conservation Society (Inc)
Wildflower Society of Western Australia
WA Native Orchid Study and Conservation Group

Other Organisations

The RAC

Individuals:

L Allnott	P Heath	O Mueller
J Branco	A Herlihy	M Owen
S Brodie	J Herne	R Petterson
M Campbell	D James	A Rawlings
L Clissa	H Jennings	T Richardson
J Connolly	B & J Jefferies (and 10	R Sallur
D Corbyn	residents of Merrifield	G Samuel (enclosing 68
L Curnow	Circle, Stenton Corner	form letters)
K Dyson	and Sellen Court)	C Schuster
R Gorton	P Jones	P Smith
C Guppy (enclosing 228	I Kitching	M Shaw
form letters)	A Lloyd	A Thomson
T & S de Grauw	F McGeorge	T Vallis
A Grimmer	S & M McKerney	J Willmott
D Grimmer	B Murphy	

Appendix 3

Summary of identification of relevant environmental factors

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
BIOPHYSICAL			
<p>Clearing of Native Vegetation</p> <p>Terrestrial flora – vegetation communities; flora of conservation significance</p>	<p>Clearing of approximately 54 ha of land through the construction of the road corridor.</p> <p>Vegetation and flora surveys identified 6 vegetation communities. Four of these were Banksia Woodlands either with Allocasuarina or Eucalyptus species as co-dominants, one was a Melaleuca Woodland and one was a heath. Four of the six vegetation types comprised 4 inferred (Gibson et al, 1994) floristic community types (FCTs), and the reservation status of those inferred FCTs is regarded as “well reserved”. The conservation status is classed as “low risk” (Gibson et al, 1994).</p> <p>Based on the vegetation condition scale (Keighery, 1994) used in Bush Forever Vol 2 (DEP, 2000), the vegetation condition in the southern end of the project area has been classified as ‘pristine’ to ‘excellent’. The rest of the project area is also in an ‘excellent’ condition in the core areas.</p>	<p>Public, Community and Conservation Groups: Comments raised focused on:</p> <ul style="list-style-type: none"> • MRWA’s appalling track record for revegetation and rehabilitation of road reserves in the metropolitan area; • minimum restoration and revegetation requirements including: <ul style="list-style-type: none"> • rehabilitation of all disturbed areas to at least 80% of pre-construction vegetation composition and similar or better weed condition within 5 years of construction; • placement by MRWA of a \$1 million rehabilitation bond; • substantial commencement of rehabilitation within 12 months of disturbance with completion in 24 months; and • monitoring and maintenance of rehabilitated areas by MRWA for at least 5 years following completion; • management of weed infestation; • dieback management; • Zamias, Balgas and Christmas trees being salvaged prior to clearing and transplanted into conservation reserves or areas of road side vegetation that are undergoing regeneration; • maintaining the bushland corridor for fauna use; and • the need for all infrastructure to be pegged before clearing to see if any trees or vegetated areas located between pathways, drainage areas and road surface areas can be retained. <p>CALM: Comments focused on:</p> <ul style="list-style-type: none"> • weed and dieback management; • the PER containing incorrect and misleading information in relation to dieback; • limiting weed and dieback invasion into bushland affected by Roe 7; • monitoring; and • the need to assess the Vegetation Management Plan. 	<p>Considered to be a relevant factor. To be addressed under the issue of Biodiversity.</p>
<p>Impacts on Declared Rare Flora</p> <p>Declared Rare and Priority Flora</p>	<p>Clearing of 54 ha of land through the construction of the road corridor.</p> <p>Surveys identified:</p> <ul style="list-style-type: none"> • 1 species of DRF <i>Caladenia huegelii</i> (also listed as an endangered species under the EPBC Act); • 1 species of priority two flora <i>Calectasia cyanea</i> 	<p>CALM Comments focused on:</p> <ul style="list-style-type: none"> • the conservation values of the area and lack of environmental offsets to mitigate impact; • translocation should not being considered an offset or mitigation for the loss of a significant area of habitat for this species; • the need to purchase suitable offset land to compensate for the loss of <i>Caladenia huegelii</i>. A delay in considering purchase of land until after translocation has been shown to be unsuccessful is inappropriate. Any delay in seeking offset land 	<p>Considered to be a significant relevant factor. To be addressed under Declared Rare Flora.</p>

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
	Direct impact on 80 <i>Caladenia huegelii</i> .	<p>purchases may result in the loss of potential acquisition areas, and thus the inability to mitigate the proposed loss of plants and habitat;</p> <ul style="list-style-type: none"> • there is no commitment to actually purchase offset land; • the PER does not indicate over what timeframe any losses will be assessed and for which MRWA will take responsibility; • concerns regarding methodology and survey of <i>Caladenia huegelii</i>; • the fact that successful translocation has not been proven; • potential impacts on pollinator species resulting from vegetation clearance and highway construction; • the impact of road construction on <i>Caladenia huegelii</i> cannot be confirmed until the decision about the final or approved alignment is made; • the need for a permit to remove DRF, even as a translocation action, by the Minister for the Environment under the <i>Wildlife Conservation Act</i>; • the translocation program not providing any background information on scientific rationale, risk assessment or success criteria. A site for translocation has not been identified. The translocation programme and the experimental research program cannot be viewed as a management option that mitigates the impacts of the proposal; • support for <i>Caladenia huegelii</i> research program. The program should investigate other options for the establishment of new populations of orchids, such as propagation by seed or tissue culture; • the research program as presented is not endorsed as an offset for construction of the highway; and • the need for a mitigation and offset package that provides tangible outcomes minimising conservation losses for the threatened flora should approval be considered for the clearing of vegetation including DRF. <p>Commonwealth Department of the Environment and Heritage Comments focused on:</p> <ul style="list-style-type: none"> • little information being provided on potential impacts on <i>Caladenia huegelii</i> to enable determination of the acceptability of the proposal pursuant to the EPBC Act; • lack of demonstration to show translocation is a viable management option for the long-term conservation of <i>Caladenia huegelii</i>. • further detail needing to be provided on: <ul style="list-style-type: none"> • measures to avoid and minimise impacts; • demonstration, with an acceptable level of confidence; that there will not be irreparable harm to the species as a whole; • how the translocation will be implemented, managed, monitored and evaluated in accordance with procedures outlined in the Guidelines; • resources, time and funding to be allocated to the development, monitoring, management and evaluation of the translocation programme; and 	

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
		<ul style="list-style-type: none"> • details on how the translocation programme will be implemented; • the need for information regarding results of the 2002 small scale translocation of <i>Caladenia huegelii</i>; • inconsistency between the EPA's objective relating to ensuring the loss percentage from translocation is no greater than 50% and the investigation of an alternative approach in the event of an excessive loss rate, and MRWA's undertaking to consider the purchase of suitable offset land in the event that the loss rate exceeds 50% of the translocated plants; • provision of details regarding the offset compensation option to be provided; and • cost of mitigation measures. <p>City of Melville Comments focused on:</p> <ul style="list-style-type: none"> • measures to reduce the impact on DRF and remnant vegetation such as reduction of the highway footprint (by reducing the median width), installing a crash barrier) and the proposed northern alignment; • the need for funding by MRWA and others to undertake more flora surveys of areas across the metropolitan areas likely to contain <i>Caladenia huegelii</i> and research into translocation and propagation of Spider orchids; and • priority being given to implementing mitigation measures in the vicinity of the highway. <p>DoE Concerns focused on:</p> <ul style="list-style-type: none"> • the need for an offset/ mitigation package; • translocation success; and • the need to review the <i>Caladenia huegelii</i> Conservation and Management Plan prior to EPA assessment and the need for this plan to be available to the public. <p>Public, Community and Conservation Groups Comments raised focused on:</p> <ul style="list-style-type: none"> • the conservation of the largest intact ecological community of <i>Caladenia huegelii</i>; • MRWA failing to demonstrate that <i>Caladenia huegelii</i> can be successfully translocated and the fact that no scientific studies have demonstrated transplantation is successful to ensure long-term survival of the species; • the inadequate compensation/ offset package; • the lack of details in relation to translocation methodology; • the EPA considering the number of DRF affected in the road reserve, rather than the number of plants affected in the overall population. If this is considered, the removal of 86 plants equates to over 60% of the population within the road reserve 	

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
<p>Potential Impacts on Rare Fauna and Impacts on local macro-fauna populations.</p> <p>Terrestrial fauna Terrestrial fauna – specially Protected (Threatened) Fauna</p>	<p>Loss and modification of habitat through clearing during road construction activities.</p> <p>No systematic survey for fauna was carried out along the highway alignment by MRWA. Fauna information reliant on fauna surveys carried out in Ken Hurst Park and Jandakot Bushland.</p> <p>Three species of recognised conservation significance have been recorded in the bushland surrounding the highway alignment:</p> <ul style="list-style-type: none"> • Western Brush Wallaby (Priority 4); • Quenda or Southern Brown Bandicoot (Priority 4); and • Short-billed (Carnaby’s) Black Cockatoo (listed as endangered under the <i>EPBC Act</i> and as Endangered under Schedule 1 of the <i>WA Wildlife Conservation Act</i>) <p>Other fauna to note include:</p> <ul style="list-style-type: none"> • the Rainbow Bee-eater, the Western Grey Kangaroo and five species of frog recorded in the vicinity of the project area. None of the frogs can be considered to be of conservation significance, • A further Schedule 1 species (native bee <i>Neopasiphae simplicior</i> and <i>Leioproctus douglasiellus</i>); Priority 3 species (native bee <i>Leioproctus contrarius</i>); a Priority 2 species (Barking Owl); and a Priority 4 species (vesper bat) could occur in the study area. 	<p>being destroyed; and</p> <ul style="list-style-type: none"> • the threat to bushland and DRF through uncontrolled burning through discarded cigarettes thrown from vehicles. <p>CALM Comments focused on:</p> <ul style="list-style-type: none"> • the risks and impacts to three invertebrate species listed under Commonwealth or State Acts as the only attempt to survey these species was by their possible association with endemic plants; • fencing associated with any underpasses should be maintained and kept in good repair; • feeding resources of Carnaby’s Black-Cockatoo; • the value of rehabilitation in offsetting the loss of native vegetation; and • being able to comment on the Fauna Management Plan. <p>Conservation Council Comments focused on:</p> <ul style="list-style-type: none"> • inadequate understanding of the dynamics of fauna populations in the area; • omission of a large fauna underpass will necessitate culling of wildlife isolated on the northern side of the route; • translocation of large macropods and Quenda is difficult; and • destruction of feeding habitat for the Carnaby Black Cockatoo. <p>City of Melville</p> <ul style="list-style-type: none"> • It is noted fauna underpasses are not being provided to enable kangaroos to cross the highway. Fauna underpasses for smaller fauna species is supported. <p>DEH</p> <ul style="list-style-type: none"> • The proponent should account for the removal of vegetation that is utilised by Carnaby’s Cockatoo in both a regional and local context and in doing so, the recommendations from Appendix D of the PER need to be addressed. <p>Public/ Community groups Comments focused on:</p> <ul style="list-style-type: none"> • proponent failing to identify appropriate methods to protect the Carnaby Cockatoo; • inability to meet EPA’s objective; • management measures to prevent road kills; • loss of habitat for the Carnaby’s Black Cockatoo; • need for replanting/translocation of Banksia’s within the road reserve and adjacent areas as early as possible; • the road creating a barrier to wildlife movement between Ken Hurst Park and the 	<p>Considered to be a relevant factor. To be addressed under the issue of Biodiversity.</p>

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
		<p>Melville's Glades Gold Course;</p> <ul style="list-style-type: none"> • lack of a comprehensive fauna survey within the reserve for the proposed route; and • affect of noise on native fauna; and quenda trapping programme. 	
<p>Bush Forever Site 245 – Ken Hurst Park</p>	<p>Ken Hurst Park abuts the southern side of the highway reserve. The park is a bushland reserve of approximately 53 ha and is vested in the City of Melville. Current zoning of the land occupied by Ken Hurst Park in the MRS is 'Rural'.</p> <p>Approximately 7.5ha (14%) of the mapped extent of Bush Forever site 245 lies inside the MRS road reserve boundary. 4.5ha of this area will be cleared as part of the Roe 7 proposal. If the northerly alignment is adopted, this will be reduced to 3.5ha</p> <p>The recommendation for Bush Forever site 245 does not preclude construction of the proposed highway.</p>	<p>CALM Comments focused on:</p> <ul style="list-style-type: none"> • support for the transfer of all uncleared portions of the highway reserve into Ken Hurst Park; • the need for a commitment for management of all vegetation directly and indirectly affected by the construction of the highway, including any vegetation outside of the highway reserve at risk from the construction; and • Bush Forever has a policy of replacing areas of vegetation if lost from Bush Forever sites. This policy is not necessarily in conflict with the Bush Forever acceptance of transport infrastructure within Bush Forever sites. The replacement of equivalent bushland area with similar values should be seriously considered as part of this project. <p>City of Melville</p> <ul style="list-style-type: none"> • Connectivity between John Connell Reserve and Ken Hurst Park should be provided. <p>Public Comments raised focused on:</p> <ul style="list-style-type: none"> • realignment of the highway to avoid impact on Ken Hurst Park; • the proposed highway extension will cut Leeming off from Ken Hurst Park, blocking access for Melville residents to the bushland; • impacts on the site due to clearing, noise, dust, edge effects such as weed and dieback, litter and increased fire risk; • the importance of Bush Forever site 245 – in terms of its vegetation being of good to excellent condition, as a fauna refuge and as part of a larger linkage system and contains Banksia woodland that is poorly conserved on the Swan Coastal Plain; • any loss of environment values should be offset by MRWA through the purchase of bushland with equivalent conservation value for inclusion into the conservation estate; and • priority should be given to mitigation measures in the vicinity of the highway. 	<p>Considered to be a relevant factor. To be addressed under the issue of Biodiversity.</p>

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
<p>Residential Amenity</p> <ul style="list-style-type: none"> • Noise • Light • Air quality • Heritage • Risk • Visual Amenity • Recreation 	<p>Construction of the highway extension will:</p> <ul style="list-style-type: none"> • increase noise levels for all residences adjacent to the alignment; • be visually prominent particularly where elevated above natural landform; • necessitate the need for route illumination; and • diminish informal access to the project area and reduce recreational activity (eg bushwalking and nature study). <p>Site was assessed by the Aboriginal Cultural Materials Committee in August 2000 as part of the DIA Sited verification project. The AMCA determined that there is insufficient information to confidently locate the assemblage of artefacts and that the site should no longer be considered as site under the <i>Aboriginal Heritage Act 1972</i>.</p> <p>Approximately 120 ha of remnant bushland on the northern side of Jandakot Airport including the Roe Highway reserve has been nominated into the database of the Australian Heritage Commission, and is known as an 'indicative' place. The entry is known as "Ken Hurst Park and Adjacent Areas, Leeming WA". The status of an "indicative" place in the data base means that the Heritage Commission has yet to make a decision on whether or not it should be included on the Register of National Estate.</p>	<p>Noise Public/ Community groups</p> <p>Comments focused on:</p> <ul style="list-style-type: none"> • placement of sound attenuation barriers along some sections of the eastern side of Kwinana Freeway between Farrington Road and South Street; • increased noise and vibration and failure to establish baseline noise levels; • a minimum 25m distance between the route and adjacent residential areas; • relocation of noise walls from the rear of property boundaries to the carriageway; • hours of operation; • noise modelling; and • noise mitigation for Ken Hurst Park. <p>City of Melville</p> <p>Comments focused on:</p> <ul style="list-style-type: none"> • the need to construct a noise wall adjacent to Balcombe Way if earth bunding and vegetation that exists along Karel Ave is cleared, to address noise and visual impact; • support for the installation of noise walls on, or adjacent to, the road reserve boundary so that they may also function as security walls. The obvious exception to this is when an alignment closer to the road provides better noise attenuation. <p>DoE</p> <p>Comments made in relation to the independent peer review on noise focused on:</p> <ul style="list-style-type: none"> • the need to extend the noise barrier at a location in Evergreen Ct (Lot 15) that exceeds the noise criteria; • the noise review investigated the effect of modifying the noise prediction methodology to better account for heavy vehicle traffic. This resulted in only modest noise increases from that originally modelled of between 0.2 and 1.9 dB. Nevertheless, in two locations the revised calculations resulted in marginal exceedances of the noise criteria, where otherwise no exceedance had been identified. The proponent should review the barrier design in light of the reviewer's modified results and comment on the need for any noise barrier adjustments; • an error was noted on the figures showing noise barrier heights. There is a 4.0 metre high barrier alongside Karel Avenue that was intended to be 2.4 metres high. Clearly this would give residents living adjacent to this barrier section a false impression of the noise relief that they may experience after the project is implemented; • barriers should be built of masonry construction, or otherwise they should demonstrate that a transmission loss of 25 dB(A) can be achieved; • the review also investigates possible improvements to the barrier design, following the concept of "as low as is reasonably practicable", by modelling a minimum barrier height of 3 metres along the length of the alignment. This highlighted areas of significant noise improvement for residences alongside Woodlea Cst, Brandwood 	<p>Noise is considered to be a relevant environmental factor.</p>

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
		<ul style="list-style-type: none"> Gdn and Evergreen Ct. The proponent should review the barrier design in light of these results and, in considering the cost-benefit of increasing or extended barriers in these areas, comment on any barrier adjustments that will be incorporated into the final design; and modelling to date has been based on the southern alignment. The northern alignment will shift the highway marginally closer to a small number of residents. It is expected that the effect of implementing the northern alignment on noise received at these residences would be negligible however it is appropriate for the proponent to model the northern alignment and comment on the results. <p>Light Public Comments focused on:</p> <ul style="list-style-type: none"> noise walls impacting on loss of view and natural lighting; and operational lighting associated with the road and the PSP - in terms of impact on adjacent residential properties. The following measures should be implemented: road lighting should be shielded where the route is less than 30m from residences; bollard lighting should be used for the PSP instead of overhead lighting; if overhead lighting is to be used for the PSP, directional shielding should be mandatory and poles should be positioned so as to minimise light spill into adjacent to residents. <p>City of Melville:</p> <ul style="list-style-type: none"> Lighting, in relation to the northerly alignment, shall not extend or adversely impact on adjoining residential properties. <p>Visual amenity Public Concerns focused on:</p> <ul style="list-style-type: none"> works on Karel Ave will result in the loss of screening vegetation and diminish the value of the bund as a visual screen. Construction works will degrade visual amenity and diminish property values; the vertical alignment of the route should be lowered to enhance noise and visual screening; native vegetation between the route and adjacent residences should be maintained to enhance visual screening; Western Power's proposed transmission line will compound visual impact; landscaping and the treatment of noise walls will not effectively ameliorate visual impacts; and impact of pedestrian overpasses and elevated areas of the road. 	<p>Light/ Visual Amenity/ Recreation</p> <p>The EPA notes that through proponent commitments, management measures and engineering design modifications to the project, that changes have resulted in lowering the impacts on residential amenity during and after construction. Measures committed to include:</p> <ul style="list-style-type: none"> locating the PSP adjacent to the road shoulder instead of constructing the PSP as a separate lane running adjacent to residential properties to the north of the road; maximisation of the separation distance between the PSP along the northern side of the proposed route and adjoining residential properties as practicable; establishment of screen walls and landscaping between the PSP and adjoining residential properties; minimising the risk of light spill from the route and PSP sensitive placement of light sources (eg lights illuminating the PSP); strategic placement and directional shielding of light sources; controlling undesirable activities (such as off-road vehicles and illegal rubbish dumping); landscaping and rehabilitation to maximise visual screening of the road and associated structures; provision of connectivity to Ken Hurst Park; implementing design measures to minimise the visual prominence of the road formation and associated structures (through physical dimensions, shape and colour); and management of access severance by establishment of a continuous PSP along the northern side of the route; provision for north-south movement across the route at Karel Avenue and consultation with the City of Melville and Canning regarding the provision of formal access to Ken Hurst Park.

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
		<p>Recreation City of Melville</p> <ul style="list-style-type: none"> Preferred alignment for the PSP is adjacent to the northern side of the road pavement for the full length of the highway from South Street to Kwinana Freeway with grade separated crossings at the three major interchanges. <p>Public: Comments focused on:</p> <ul style="list-style-type: none"> Leeming residents need to be able to access and enjoy the bushland corridor for their recreation; location of the PSP; positioning of the PSP adjacent to residential properties is regarded as a security concern and is likely to increase litter impacts on adjoining properties; and severing local access to Ken Hurst Park and thereby recreational, educational and passive use of the area. <p>Air Quality Public: Concerns focused on:</p> <ul style="list-style-type: none"> dust during construction; dust causing health problems for residents; air pollution impacts on local residents; the need for comprehensive dust control measures; and the need for a regional air quality. <p>DoE Comments:</p> <ul style="list-style-type: none"> the regional air quality peer review analysis is sound, benefiting from a long period of software development and validation in this department. The review of emissions changes appears sound, and correctly draws attention to the limitations of the traffic modelling component of the task; and the independent air quality assessment review is thorough and of an acceptable standard, having considered the crucial issues including the high level of conservatism in the estimates, the limitations of the data sets available and model applicability / accuracy. 	<p>The EPA also notes that in the proponent's response to submissions that:</p> <ul style="list-style-type: none"> residents will be consulted regarding the colour and patterning of noise walls; the current design of the PSP is based on alignment along the carriageway except where deviation is necessary for the path to negotiate the major road interchanges. Any change in the PSP alignment subsequent to EPA reporting will be addressed consultatively with the Authority and other key stakeholders; and DPI's approval for the ultimate alignment will be required. <p>Light, visual amenity and recreation are not considered to be relevant environmental factors.</p> <p>Air Quality The EPA notes that the development will meet current air quality standards at the local scale and regional scale.</p> <p>Local Air quality</p> <p>The EPA notes that an independent peer review was carried out by Air Assessments (March 2004) on the "Assessment of Potential Air Quality Impacts - Roe Highway (Stage 7)", CSIRO 2004. The EPA notes that this review concludes that the report is a fair and representative assessment of the local air quality impacts from the project, with the likely concentrations predicted to be well below those for concern for health impacts.</p> <p>Regional air quality As part of the assessment of the environmental impacts of the Roe Highway - Stage 7 extension, the DoE requested that the Roe 7 Alliance undertake an evaluation of regional air quality impacts arising from the Roe Highway Stage 7 project. The impact of the Roe 7 Highway Stage 7 extension on regional air quality was assessed by Air Assessments (April, 2004)</p>

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
			<p>by using the photochemical smog model CIT and up to date forecasts of the traffic flow in the Perth region for the years 2006 and 2021, with and without the Roe Highway Stage 7 extension.</p> <p>The EPA notes that the conclusions drawn from this report indicate that:</p> <ul style="list-style-type: none"> • for 2006 and 2021 the construction of the Roe 7 extension will only lead to slight changes in the total vehicle kilometres travelled (VKTs) in the Perth region; • it is predicted that there will be negligible changes to the predicted maximum 1-hour ozone level; and • the Roe 7 extension will make an insignificant change to Perth's smog levels. If induced traffic flows are also considered, given the very small change predicted using the Main Roads forecast above, it is still expected that the change to regional smog levels will remain insignificant. <p>The EPA notes that the proponent has committed to:</p> <ul style="list-style-type: none"> • preparing and implementing a Dust Management Plan; • providing rapid stabilisation of disturbed areas or new embankments through timely and progressive mulching and revegetation; and • monitoring and rectifying any problem areas for the duration of the two years defects liability period. <p>Management measures include:</p> <ul style="list-style-type: none"> • dust suppression - water carts, installation of solid board and fabric fences, crate walls and hay bales to supplement watering to control dust movement; placement of appropriately spaced barriers perpendicular to prevailing winds to reduce dust lift, and surface stabilisation; • implementing a damping down schedule of all work areas to ameliorate unacceptable levels; • good housekeeping;

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
		<p>Heritage Heritage Council of Western Australia Information has previously been provided on places of cultural heritage value that might have appeared in the study area. Comments within Section 2 of the PER have been noted.</p> <p>Risk of site contamination City of Melville</p> <ul style="list-style-type: none"> Reinstatement of any portion of John Connell Reserve and or landfill disturbed by the construction must be implemented and remediated in accordance with all relevant Health and Safety standards/regulations and to the satisfaction of the Manager Planning and Development Services. <p>DoE Comments focused on:</p> <ul style="list-style-type: none"> soil sampling is recommended to ensure clear identification of asbestos waste disposal area within John Connell Reserve adjacent to the proposed route; an Asbestos Management Plan would need to be prepared should the proposed route extend into the asbestos waste area. in the event that acid sulphate soils (ASS) are found beneath the project area, an ASS Management plan will need to be prepared and implemented; and nature and extent of any contamination at the soils blending site. 	<ul style="list-style-type: none"> all loads entering or leaving the site will be covered or otherwise treated to prevent dust during transit; marking clearing limits; commencing construction in the winter months when the soil will be moist and less prone to being transported off site; monitoring dust and windblown sand levels on a daily basis during construction; and cessation of work under adverse wind conditions. <p>Air Quality is not considered to be a relevant environmental factor.</p> <p>Heritage In relation to heritage, the EPA notes:</p> <ul style="list-style-type: none"> the status of the artefact scatter; and the proponent's commitment to prepare plans, guidelines and procedures to address and manage aboriginal and European heritage as part of the Construction EMP. <p>Heritage is not considered to be a relevant environmental factor.</p> <p>Risk/ site contamination With regard to risk of site contamination, the EPA notes that the proponent has indicated in its response to submissions that the extent of asbestos waste disposal within John Connell Reserve has been identified in conjunction with the City of Melville, and avoidance of any intrusion into this area (proposed route or PSP) has been a design priority;</p> <ul style="list-style-type: none"> the proposed route is at least 30m from the asbestos waste disposal area, and as such there is no risk that it would encroach upon the disposal area; and there is no requirement for excavation below the watertable and as such the risk of encountering ASS is very low.

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
			<p>The EPA also notes that the proponent has committed to:</p> <ul style="list-style-type: none"> • preparing and implementing an Asbestos Waste Management Strategy in the event that disturbance of the emplaced asbestos is unavoidable; • conducting an assessment for site contamination at the Soils Blending and Nursery sites prior to the commencement of construction. Any remediation action required will be addressed with relevant regulatory agencies; and • preparing and implementing a site stormwater and hazardous materials handling Management Plan as part of the Construction EMP. <p>Risk is not considered to be a relevant environmental factor.</p>
<p>Proximity of Underground Water Pollution Control Area</p> <ul style="list-style-type: none"> • Surface Water quality • Groundwater quality 	<p>The highway alignment traverses the northern section of the Jandakot groundwater mound. The regional road reservation for Roe Highway Stage 7 falls within the Jandakot Underground Water Pollution Control Area Priority 3 protection level between Kwinana Freeway and Karel Avenue. A Priority 1 designated area abuts the southern boundary of the highway reserve along the same section.</p> <p>The soils along the alignment are generally deep, sandy and well drained. Infiltration of rain is rapid and the maximum groundwater elevations varies from 2-16 metres below natural surface.</p>	<p>WRC (DoE Swan Goldfields Region)</p> <p>Comments focused on</p> <ul style="list-style-type: none"> • the proposed route passes through a Priority 3 portion of the Jandakot Underground Water Pollution Control Area and adjoins a Priority 1 area. The route is regarded as compatible with Priority 3 groundwater protection objectives provided best industry design and construction practice is adopted; • final drainage design should be reviewed by relevant regulatory agencies; • drainage containment features are not to be located within 300m wellhead protective zone of any drinking water production bore; • The construction management plan will need to include consideration of the storage of potential contaminants (fuels and chemicals) and spill contingency planning; • a groundwater licence will be needed for the abstraction of construction water; • in the event that the project will require dewatering, a dewatering licence will need to be obtained from the WRC; and • stormwater management issues have been adequately addressed. Preliminary stormwater plans should be submitted to the relevant regulatory authorities for review at the 15% and 80% completion stages. <p>Public: The impact of road runoff and spills is not adequately addressed.</p>	<p>The EPA expects that during construction of the road, consideration is given to planning strategies and best management practices that minimise adverse impacts upon water resources resulting from inappropriate construction, design or maintenance of roads.</p> <p>The EPA notes that consideration has been given to the containment of spills in the area directly adjacent to the Priority 1 UWPCA through the provision of kerbing and pollutant collecting basins.</p> <p>The EPA notes the proponents commitments to:</p> <ul style="list-style-type: none"> • prepare and implement management plans for site stormwater and hazardous materials handling, and soil and contamination; • design the road drainage system in accordance with the principles agreed upon with the WRC/ DEP intended to protect the UWPCA; and • replace wetland values and functions lost as a result of the proposed highway extension.

Summary of Identification of Relevant Environmental Factors

Preliminary Environmental Issue and Relevant Factors	Proposal Characteristics/ Existing Environment	Government Agency and Public Comments	Identification of Relevant Environmental Factors
			<p>The EPA also notes that in response to submissions the proponent has indicated: that:</p> <ul style="list-style-type: none"> • the closest Water Corporation groundwater production bores are greater than 300m south of the project area and hence drainage containment features will not impinge on the Wellhead Protective Zone; the proposed route has been designed to avoid the need for dewatering; • because groundwater flows in a north-west direction and towards Roe Highway, the water corporation groundwater production bores in the Glen Iris suburb will not be affected; and • the design of basins to control low volume pollutants at pipe outlets is still being developed although the most likely outcome will be an impervious basin that can support vegetation growth thereby holding pollutants within a contained area. <p>On this last point, the EPA considers that in the event of a chemical spill incident, these buffers will lower the immediate contamination risk to waters, act as contaminant filters and allow time for effective remedial action. Further, these buffers may need to be supported by other protective measures e.g. roadside depressions to capture chemical spills along designated industrial transport routes and be wide enough to be self-sustaining, and (where practical) fenced to exclude people, vehicle and stock intrusion.</p> <p>The EPA is cognisant of the threat of pollution to groundwater sources in the area and therefore recognises the need for careful management throughout the construction phase, especially within the Jandakot UWPCA.</p> <p>Not considered to be a relevant environmental factor.</p>

Appendix 4

Summary of Relevant Environmental Factors/ Issues and their Management

Summary of Relevant Environmental Factors/ Issues in relation to Management

Factors/ Issues	EPA Objective(s)	Summary of Government Agency and Public Comments	Co-proponents commitments and environmental management measures	EPA Assessment
BIOPHYSICAL				
Declared Rare and Priority Flora	Protect Declared Rare and Priority Flora consistent with provisions of the <i>Wildlife Conservation Act 1950</i> and the <i>Environment Protection and Biodiversity Act 1999</i> .	<p>Key comments raised by state, federal and local government focused on:</p> <ul style="list-style-type: none"> • the need for a mitigation and offset package that provides tangible outcomes minimising conservation losses for <i>Caladenia huegelii</i>; • the need to purchase suitable offset land to compensate for the loss of <i>Caladenia huegelii</i>. Any delay in considering purchase of land may result in the loss of potential acquisition areas, and thus the inability to mitigate the proposed loss of plants and habitat; • translocation should not be considered an offset or mitigation for the loss of a significant area of habitat for this species; • successful translocation not being proven; • the potential impacts on pollinator species; • the lack of detail regarding the <i>Caladenia huegelii</i> research program; • the viability of long-term conservation of <i>Caladenia huegelii</i>; • the need to provide details on measures to avoid and minimise impacts; • the proposed offset compensation, and cost of mitigation measures; • measures to avoid and minimise impacts; • how the translocation will be implemented, managed, monitored and evaluated in accordance with procedures outlined in the Guidelines; • resources, time and funding to be allocated to the development, monitoring, management and evaluation of the translocation programme; • details on how the translocation programme will be implemented; and • priority being given to implementing mitigation measures in the vicinity of the highway. <p>The public, community and conservation groups all raised similar issues pertaining to:</p>	<p>Environmental Management Commitments:</p> <ul style="list-style-type: none"> • Prepare and implement a <i>Caladenia huegelii</i> Conservation and Management Plan. • Implement the Mitigation and Offset Strategy which includes funding a programme of research to improve the understanding of the ecology and biology of <i>Caladenia huegelii</i>. 	<p>The EPA considers the factor of Declared Rare Flora has been adequately addressed and can meet the EPA's objectives for this factor provided:</p> <ul style="list-style-type: none"> • the northerly alignment is implemented; • the Huntingdale land or an equivalent area of comparable habitat value is acquired for conservation purposes; • the implementation of the mitigation and offset strategy (including local offsets operational and management controls and research contributions); and • the proponent preparing and implementing a <i>Caladenia huegelii</i> translocation and monitoring management plan. <p>Having particular regard to the:</p> <ol style="list-style-type: none"> (a) recommended Environmental Condition 6; (b) recommended Environmental Condition 8; and (c) the proponent's commitments; <p>it is the EPA's opinion that the proposal is capable of being managed to meet the EPA's environmental objective for this factor.</p>

Summary of Relevant Environmental Factors/ Issues in relation to Management

Factors/ Issues	EPA Objective(s)	Summary of Government Agency and Public Comments	Co-proponents commitments and environmental management measures	EPA Assessment
		<ul style="list-style-type: none"> the protection and conservation of <i>Caladenia huegelii</i>; MRWA failing to demonstrate that <i>Caladenia huegelii</i> can be successfully translocated; the inadequate compensation/ offset package; measures to avoid and minimise impacts (eg reduce footprint); and the lack of details in relation to translocation methodology. 		
<p>Biodiversity</p> <ul style="list-style-type: none"> Terrestrial flora – vegetation communities flora of conservation significance Terrestrial fauna Terrestrial fauna – specially Protected (Threatened) Fauna Bush Forever Site 245 	<ul style="list-style-type: none"> Maintain the abundance, species diversity, geographic distribution and productivity of terrestrial flora and fauna. Ensure that regionally significant flora and vegetation communities in Bush Forever sites are adequately protected Protect Specially Protected (Threatened) Fauna consistent with provisions of the <i>Wildlife Conservation Act 1950</i>. 	<p>Key comments focused on:</p> <ul style="list-style-type: none"> MRWA's appalling track record for revegetation and rehabilitation of road reserves in the metropolitan area; minimum restoration and revegetation requirements; dieback and weed management; maintaining the bushland corridor for fauna use; the need for all infrastructure to be pegged before clearing to see if any trees or vegetated areas located between pathways, drainage areas and road surface areas can be retained; monitoring; the value of rehabilitation in offsetting the loss of native vegetation; inadequate understanding of the dynamics of fauna populations in the area; fauna movement and relocation; loss of feeding habitat for the Carnaby's Black Cockatoo; support for the transfer of all uncleared portions of the highway reserve into Ken Hurst Park; management of all vegetation directly and indirectly affected by the construction of the highway, including any vegetation outside of the highway reserve at risk from the construction; the replacement of equivalent bushland area with similar values; loss of environment values should be offset by MRWA through the purchase of bushland 	<p>Environmental Management commitments:</p> <ul style="list-style-type: none"> Prepare and implement a Fauna Management Plan to minimise impacts on threatened fauna species and to ensure effective management of kangaroos affected by the project. The plan will address all issues associated with design and construction, as they pertain to the protection of local fauna, and to mitigation of impacts on local fauna populations such as: <ul style="list-style-type: none"> the link between the Fauna management plan and the Vegetation Management Plan; fauna food plants to be incorporated into revegetation; design and of fauna underpasses; trapping and relocation of quenda; and management and monitoring requirements for kangaroos and fauna fencing. Prepare and implement a Pest and Disease Management Plan, address dieback, which will be reviewed by CALM prior to implementation Prepare and implement a Vegetation Management Plan to minimise the extent of clearing required for the project and to mitigate for the loss of significant vegetation. The plan will be provided to CALM for review and address: <ul style="list-style-type: none"> clearing boundaries; procedures for the removal, handling 	<p>The EPA notes:</p> <ul style="list-style-type: none"> the conclusion drawn by Johnstone et al, 2003 that the loss of some native vegetation along the proposed alignment would not have a significant impact on the overall feeding area used by the cockatoos; the vegetation and fauna habitats of the project area are well represented in nearby reserves such as KHP and on the Jandakot Airport site; that the site provides a linkage between Bibra Lake, Beeliar Regional Park, Ken Hurst Park and other conservation areas; the proponent has developed a mitigation and offset strategy that commits to rationalisation of land to facilitate conservation management of residual areas of native vegetation in the vicinity of the Roe 7 reserve including <ul style="list-style-type: none"> placing a covenant over a 4.5 ha area near Fern Leaf Court (adjacent to John Connell Reserve) and place this into the conservation estate incorporating approximately 11 ha into Ken Hurst Park; and placing a covenant over approximately 11.6ha of good quality remnant vegetation into conservation used for feeding by Carnaby's cockatoos. MRWA has committed to restoration of 3-5 ha of degraded bush in the area and financial and in-kind contributions to maintaining remnant vegetation in Ken Hurst Park and other areas in the vicinity of the project. <p>Having particular regard to the:</p> <ul style="list-style-type: none"> the proponent's commitments (including the implementation of the Mitigation and Offset

Summary of Relevant Environmental Factors/ Issues in relation to Management

Factors/ Issues	EPA Objective(s)	Summary of Government Agency and Public Comments	Co-proponents commitments and environmental management measures	EPA Assessment
		<p>with equivalent conservation value for inclusion into the conservation estate;</p> <ul style="list-style-type: none"> realignment of the highway to avoid impact on Ken Hurst Park; the importance of Bush Forever site 245 in terms of its vegetation, as a fauna refuge and as part of a larger linkage system; and priority should be given to mitigation measures in the vicinity of the highway. 	<p>and storage of vegetation and topsoil;</p> <ul style="list-style-type: none"> dieback hygiene requirements; stripping, management and reuse of topsoil; selective harvesting of site won material in order to avoid the spread of weedy species; site preparation activities; and revegetation (including timing, success criteria, management and monitoring). 	<p>strategy);</p> <ul style="list-style-type: none"> management measures; and recommended condition 7 in relation to preparing a and implementing a rehabilitation plan; <p>it is the EPA's opinion that the proposal is capable of being managed to meet the EPA's environmental objectives.</p>
Noise	<ul style="list-style-type: none"> Protect the amenity of residents from noise and vibration impacts resulting from activities associated with the construction and operation of the proposal by ensuring that noise and vibration levels meet statutory requirements and acceptable standards. 	<p>Comments focused on:</p> <ul style="list-style-type: none"> placement of sound attenuation barriers; increased noise and vibration; the need for a minimum 25m distance between the route and adjacent residential areas; failure to establish baseline noise levels; relocation of noise walls from the rear of property boundaries to the carriageway; hours of operation; noise modelling; and the installation of noise walls on, or adjacent to, the road reserve boundary so that they may also function as security walls (City of Melville). <p>DoE</p> <p>The main comments made in relation to the independent peer review on noise focused on:</p> <ul style="list-style-type: none"> the need to extend a noise barrier eastwards at a location in Evergreen Ct (Lot 15) to ensure noise criteria are not exceeded; the need to review barrier design and noise barrier adjustments in two locations to ensure noise criteria are not exceeded; an error was noted on the figures showing noise barrier heights. There is a 4.0 metre high barrier alongside Karel Avenue that was intended to be 2.4 metres high. This would give residents living adjacent to this barrier section a false impression of the noise relief that they may experience after the project is implemented; 	<p>Environmental commitments:</p> <ul style="list-style-type: none"> Prepare and implement a Noise and Vibration Management Plan as part of the construction EMP to ensure that residential properties within areas adjoining the project area will not be significantly affected. Ensure all residential or other noise sensitive premises adjacent to the alignment do not exceed the base level criteria of 63dB(A) for day time noise and 55 db(A) for night time noise through the provision of a range of noise attenuation barriers. Identify a "best practice" approach to traffic noise mitigation in consultation with the DoE. <p>Management measures</p> <p>Measures include:</p> <ul style="list-style-type: none"> further noise modelling during detailed design to more accurately determine the location and size of noise walls; installation of noise barriers; compliance with base level noise criteria of 63dB(A) for daytime and 55dB(A) for night-time or alternative 'best practice' standard as agreed with the DEP; and compliance with Regulation 13 of the EP (noise) Regulations 1997 to manage noise impacts during construction. 	<p>The EPA notes that:</p> <ul style="list-style-type: none"> the proponent has undertaken noise modelling and that this data/ information has been independently peer reviewed; and the independent review (Lloyd, 2004) verified that the methodology, assumptions and calculations used to design the noise barriers for the proposal are reasonable and that the noise sensitive receivers adjacent to the highway are likely to receive noise levels below the criteria with the proposed noise barriers; <p>The proponent has indicated in its response to submissions that:</p> <ul style="list-style-type: none"> that noise walling will be extended to address Evergreen Ct (Lot 15); during the detailed design stage: <ul style="list-style-type: none"> further noise modelling will be undertaken to more accurately determine the location and size of noise walls and final heights of walls; the most appropriate methodology for noise abatement will be undertaken; a thorough review of noise wall sizes and locations. The noise heights currently shown are the minimum required to achieve the noise level objectives. Individual consultation with residents during the detailed design phase will help determine whether increasing wall heights to further decrease noise is more preferable in lieu of attempting to minimise the impact of the wall; and further noise modelling will more accurately determine the location and size of noise walls and that this will include the selected alignment (north or south);

Summary of Relevant Environmental Factors/ Issues in relation to Management

Factors/ Issues	EPA Objective(s)	Summary of Government Agency and Public Comments	Co-proponents commitments and environmental management measures	EPA Assessment
		<ul style="list-style-type: none"> • barriers should be built of masonry construction, or otherwise they should demonstrate that a transmission loss of 25 dB(A) can be achieved; • the proponent should review the barrier design for residences alongside Woodlea Cst, Brandwood Gdn and Evergreen Ct to enable possible improvements to the barrier design; • it is expected that the effect of implementing the northern alignment on noise would be negligible however it is appropriate for the proponent to model the northern alignment and comment on the results. 		<p style="text-align: center;">alignment (north or south);</p> <p>Having particular regard to:</p> <ul style="list-style-type: none"> • the proponent compiling with the <i>Environmental Protection Noise Regulations 1997</i> including regulation 13 • the independent review of noise impact assessments; • design modifications to the proposal; and • proponent's commitments, <p>it is the EPA's opinion that the proposal can be managed to meet the EPA's objectives.</p>

Appendix 5

Recommended Environmental Conditions and Proponent's Consolidated Commitments

RECOMMENDED ENVIRONMENTAL CONDITIONS

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

Roe Highway Stage 7 Extension (South Street in Canning Vale to Kwinana Freeway in Leeming)

Proposal: Construction of Roe Highway Stage 7 from South Street in Canning Vale to connect to Kwinana Freeway in Leeming over a distance of approximately 4.5 kilometres, as documented in Schedule 1 of this statement.

Proponent: Main Roads Western Australia

Proponent Address: 1110 Hay Street
WEST PERTH WA 6005

Assessment Number: 1466

Report of the Environmental Protection Authority: Bulletin 1138

The proposal referred to above may be implemented by the proponent subject to the following conditions and procedures:

1 Implementation

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 and schedule 3 of this statement.

3 Proponent Nomination and Contact Details

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

- 3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.
- 3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

- 4-1 The proponent shall substantially commence the proposal within five years of the date of this statement or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment will determine any dispute as to whether the proposal has been substantially commenced.

- 4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

1. the environmental factors of the proposal have not changed significantly;
2. new, significant, environmental issues have not arisen; and
3. all relevant government authorities have been consulted.

Note: The Minister for the Environment may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

5 Compliance Auditing and Performance Review

- 5-1 The proponent shall prepare an audit programme in consultation with and submit compliance reports to the Department of Environmental Protection which address:
1. the status of implementation of the proposal as defined in schedule 1 of this statement;
 2. evidence of compliance with the conditions and commitments; and
 3. the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive

the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

- 5-2 The proponent shall submit a performance review report every five years after the start of operations, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, which addresses:
1. the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;
 2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;
 3. significant improvements gained in environmental management, including the use of external peer reviews;
 4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and
 5. the proposed environmental targets over the next five years, including improvements in technology and management processes.
- 5-3 The proponent shall submit a report prepared by an auditor approved by the Department of Environmental Protection under the “Compliance Auditor Accreditation Scheme” to the Chief Executive Office of the Department of Environmental Protection on each condition/commitment of this statement which requires the preparation of a management plan, programme, strategy or system, stating that the requirements of each condition/commitment have been fulfilled within the timeframe stated within each condition/commitment.

Conservation Initiatives

- 6-1 Within 12 months following the issuing of the notice to the Decision Making Authorities under Section 45(7) of the *Environmental Protection Act 1986*, the proponent shall implement its commitment to contribute to the acquisition of Lots 100 and 101 Gay Street, Huntingdale or an equivalent area of comparable ecological value and for this land to be placed into the conservation estate to be managed by the Department of Conservation and Land Management to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.
- 6-2. Within 18 months following the issuing of the notice to the Decision Making Authorities under Section 45(7) of the *Environmental Protection Act 1986*, the proponent shall implement the northerly alignment as approved by the Western Australian Planning Commission on 15 April 2004.

- 6-3 Within 18 months following the issuing of the notice to the Decision Making Authorities under Section 45(7) of the *Environmental Protection Act 1986*, the proponent shall demonstrate to the Minister for the Environment how the mitigation and offset strategy (see Schedule 3) has been implemented.

Rehabilitation Plan

- 7-1 Prior to construction, the proponent shall prepare a Rehabilitation Plan which provides the framework to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, the Department of Conservation and Land Management and the City of Melville.

The objective of this plan is to revegetate those areas within the road reserve disturbed during construction.

This plan shall address:

1. rehabilitation of all disturbed areas;
 2. completion criteria;
 3. a rehabilitation schedule including timing;
 4. restoration and revegetation requirements;
 5. management measures (such as weed management);
 6. monitoring and maintenance of rehabilitated areas for at least 5 years following completion;
 7. remedial actions; and
 8. community involvement and consultation.
- 7-2 The proponent shall implement the Rehabilitation Plan required by condition 7-1 until such time as the Minister for the Environment determines, on advice of the Environmental Protection Authority, that the proponent's rehabilitation responsibilities have been fulfilled.
- 7-3 The proponent shall make the Rehabilitation Plan required by condition 7-1 publicly available for a public comment period of two weeks prior to the Environmental Protection Authority finalising its consideration of the plan.

8 *Caladenia huegelii* Translocation and Monitoring Management Plan

- 8-1 Prior to commencement of translocation activities, the proponent shall prepare a *Caladenia huegelii* Translocation and Monitoring Plan, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, the Department of Conservation and Land Management and the Botanic Gardens and Parks Authority.

The objectives of this Plan are to:

- establish the baseline health condition of *Caladenia huegelii* prior to translocation undertaken as part of this proposal;
- establish a methodology to achieve translocation success of at least 50%;

- monitor and assess any changes in the health of the *Caladenia huegelii* population following translocation; and within the area immediately surrounding the Roe 7 corridor;
- monitor and assess the success of translocation;
- compare net *Caladenia huegelii* mortality at potential impact monitoring sites with ‘threshold’ and ‘limit’ levels for net *Caladenia huegelii* mortality, within the zones of influence of road construction activities.

This Plan shall address, but not be limited to, the following:

1. the location of appropriate *Caladenia huegelii* potential impact monitoring sites and reference sites;
2. the number of plants and locations of plants to be translocated;
3. locations for translocation sites;
4. translocation methodologies to achieve translocation success of at least 50% of plants;
5. the location of appropriate monitoring sites and reference sites;
6. protocols and procedures for monitoring and quantitatively assessing the extent of successful translocation of *Caladenia huegelii* using appropriate *Caladenia huegelii* monitoring surveys at all of the potential impact monitoring sites.
7. calculations of statistical power of the monitoring procedures referred to in point 6 above to demonstrate that the procedures are appropriate to assess the extent of mortality against the ‘threshold’ and ‘limit’ levels set out in condition 8-2;
8. contingencies and remedial actions;
9. reporting requirements; and
10. community consultation and involvement.

8-2 The proponent shall implement the *Caladenia huegelii* Translocation and Monitoring Management Plan required by condition 8-1.

8-3 The proponent shall make the *Caladenia huegelii* Translocation and Monitoring Management Plan required by condition 8-1 publicly available.

Procedures

- 1 Where a condition states “to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority”, the Environmental Protection Authority will provide that advice to the Department of Environmental Protection for the preparation of written notice to the proponent.
- 2 The Environmental Protection Authority may seek advice from other agencies, or organisations as required, in order to provide its advice to the Department of Environmental Protection.

Notes

1. The Minister for the Environment notes that the purchase of Lots 100 and 101 Gay Street Huntingdale, or an equivalent area of comparable ecological value will be

undertaken by Government on behalf of Main Roads Western Australia and the Public Transit Authority.

2. The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.
3. Within this statement, to “have in place” means to “prepare, implement and maintain for the duration of the proposal”.

Schedule 1

The Proposal (Assessment Number 1466)

The proposal involves the extension of Roe Highway from South Street in Canning Vale to Kwinana Freeway in Leeming (see Figure 1 attached).

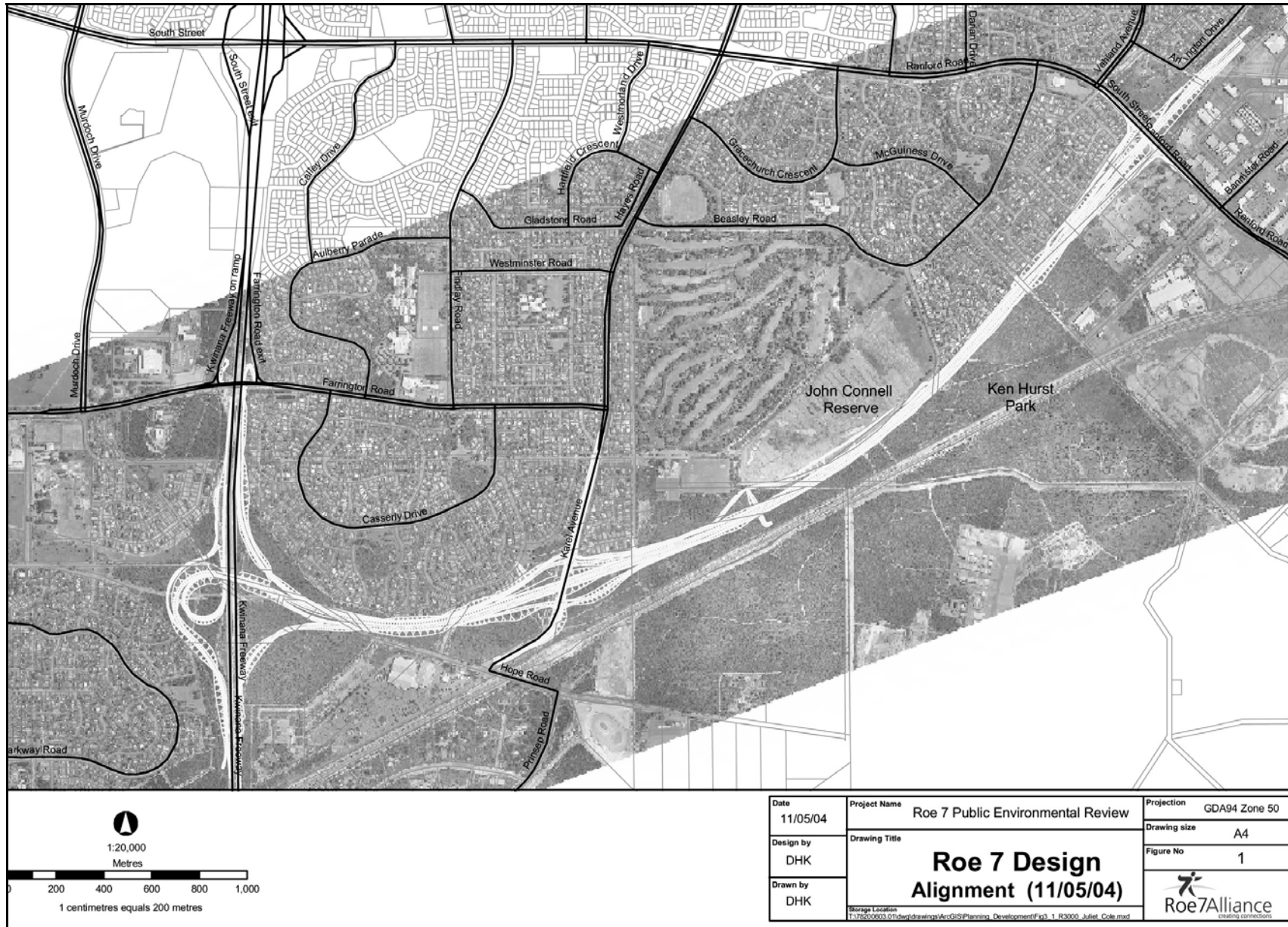
The key characteristics of the proposal are described in Table 1 below.

Table 1: Key proposal characteristics

Element	Description
Proposal description	Design, construct and operate a four lane highway from South Street to Kwinana Freeway, with allowance for future widening to six lanes. The proposal includes construction of all road pavements, access roads, drainage basins, drains, medians, grade separated interchanges, ramps, traffic signals, associated earthworks, Principal Shared Paths, other shared paths, road bridges, underpasses, culverts, lighting, noise barriers, fencing, landscaping and signs.
Length of highway	Approximately 4.5 kilometres.
Area of road reserve	Approximately 130.6 hectares.
Cross-section – first stage two lanes in each direction	3.0m shoulder, 2 x 3.5m lanes, 1.0m shoulder, 13m median (including median shoulders), 1.0m shoulder, 2 x 3.5m lanes and 3.0m shoulder.
Cross-section – ultimate stage three lanes in each direction	3.0m shoulder, 3 x 3.5m lanes, shoulder median, shoulder (width of all to be determined), 3x3.5m lanes and 3.0m shoulder
Area of surfaced road	Approximately 18 hectares including interchanges (Stage 1).
Area of clearing	Approximately 62 ha (including batters and drainage basins, and approximately 8 ha of already degraded areas).
<i>Caladenia huegelii</i> directly affected by the proposed route	Approximately 74 individuals.
Area to be revegetated	Approximately 31 hectares (including batters and drainage basins).
Construction duration	Constructed over a period between July 2004 and December 2005.
Grade separated intersections	South Street, Karel Avenue, Kwinana Freeway.
Bridges and Underpasses	Road bridges at South Street (two bridges), Karel Avenue and Kwinana Freeway; and pedestrian underpasses at South Street off-ramp and Karel Avenue.
General standard of design and construction	Design speed 70kph to 100kph – Austroads and Main Roads Western Australia standards.
Construction and materials source	Road constructed in cut and fill. Additional fill obtained from approved sources (eg sand mines) and suppliers.

Figures

- Figure 1 – Roe Highway Stage 7 Alignment
- Figure 2 – Plan 1 - Offset and Interchange Banksia Conservation Areas Roe Highway Stage 7




Date 11/05/04	Project Name Roe 7 Public Environmental Review	Projection GDA94 Zone 50
Design by DHK	Drawing Title Roe 7 Design Alignment (11/05/04)	Drawing size A4
Drawn by DHK	Storage Location <small>T:\76200603_01\dwg\drawings\ArcGIS\Planning_Development\fig3_1_R3000_Justet_Cole.mxd</small>	Figure No 1
		 Roe7Alliance <small>creating connections</small>

Figure 1: Roe Highway Stage 7 Alignment

Proponent's Environmental Management Commitments

May 2004

**Roe Highway Stage 7 Extension (South Street in
Canning Vale to Kwinana Freeway in Leeming)**

(ASSESSMENT NO. 1466)

No	Topic	Actions	Objectives	Timing	Advice From
1	Environmental Management System (EMS)	Prepare a construction EMS consistent with the core requirements of the ISO 14001 standard.	To manage relevant environmental factors during construction of the Roe Highway Stage 7.	Prior to construction.	
2	Environmental Management System (EMS)	Implement the construction EMS referred to in commitment 1.	Achieve the objectives of commitment 1.	During construction.	
3	Environmental Management Plan	Develop, as part of the construction EMP, plans, guidelines and procedures to address and manage the following environmental issues: 1. noise and vibration; 2. dust; 3. construction traffic; 4. site stormwater and hazardous materials; 5. groundwater protection; 6. lighting control; 7. flora; 8. declared rare flora; 9. pests and diseases; 10. fauna; 11. soil contamination; 12. aboriginal and European heritage; 13. waste management; 14. air quality; and 15. aesthetic	To manage and minimise the potential impacts of the construction phase of the Roe Highway Stage 7.	Prior to construction	CALM, WRC
4	Environmental Management Plan	Implement the construction EMP referred to in commitment 3.	Achieve the objectives of commitment 3.	During construction.	CALM, WRC, MRWA
5	Vegetation Management Plan	Prepare a Vegetation Management Plan, for the construction EMP, based on best practice and sound ecological principles. This will address: 1. demarcating clearing boundaries;	<ul style="list-style-type: none"> Minimise the extent of clearing required for the project through design and rigorous management of construction activities. 	Prior to construction	CALM

No	Topic	Actions	Objectives	Timing	Advice From
		<ol style="list-style-type: none"> 2. selective harvesting of site won organic material in order to avoid the spread of weedy species; 3. dieback requirements; 4. stripping, management and reuse of topsoil; 5. site preparation activities including decompaction, furrowing or other surface preparation and mulching; 6. documentation of a revegetation schedule providing details of the species to be used, where they will be used, propagule densities (seeding rates and/or planting density) and what type of seeding or planting regime will be employed; 7. optimal timing for all activities; 8. success criteria for revegetation; and 9. management, maintenance, monitoring and remedial activities to ensure a successful outcome. 	<ul style="list-style-type: none"> • Mitigate for the loss of significant vegetation 		
6	Vegetation Management Plan	Implement the Vegetation Management Plan referred to in commitment 5.	Achieve the objectives of commitment 5.	During construction	CALM
7	Native Vegetation	Review the MRS road reserve boundary once construction is complete.	Achieve the objectives of commitment 5.	Post Design	City of Melville, City of Cockburn, City of Canning, DPI, WAPC
8	Native Vegetation	Maximise the extent of conservation management of remnant native vegetation including, for example, through incorporation into Ken Hurst Park.	Achieve the objectives of commitment 5.	Post Design	City of Melville, City of Cockburn, City of Canning, DPI, WAPC
9	<i>Caladenia huegelii</i> Conservation and Management Plan	Prepare a <i>Caladenia huegelii</i> Conservation and Management Plan that addresses: 1. the exact locations of all of the <i>C.</i>	<ul style="list-style-type: none"> • Minimise the impact on the significant flora species through design and rigorous 	Prior to construction	CALM, DEH, KPBG, City of Melville, F of KHP, WAOSG

No	Topic	Actions	Objectives	Timing	Advice From
		<p><i>huegelii</i> plants in the local population (combined survey data for 2002-2004 flowering seasons);</p> <ol style="list-style-type: none"> 2. the numbers of plants to be translocated; 3. locations for translocation sites; 4. translocation methodologies and possible trial design for comparing methodologies; 5. logistics and materials required for implementation of the programme; 6. habitat remediation such as weed control; 7. consultation strategy development and implementation, and 8. monitoring and reporting requirements. 	<p>management of construction activities.</p> <ul style="list-style-type: none"> • Mitigate for the impacts on the population of DRF. • Ensure protection of the remaining population and its habitat. 		
10	<i>Caladenia huegelii</i> Conservation and Management Plan	Implement the <i>Caladenia huegelii</i> Conservation and Management Plan referred to in commitment 9.	Achieve the objectives of commitment 9.	Prior to construction	CALM
11	Mitigation and Offsets Strategy	Implement the Mitigation and Offsets Strategy (see Schedule 3).	<p>Mitigate unavoidable impacts in respect of:</p> <ul style="list-style-type: none"> • viability of populations of the Grand Spider Orchid (<i>Caladenia huegelii</i>); • extent, quality, connectivity and level of protection of remnant Banksia woodland; • access of local residents and others to areas of natural bush; and • extent, quality and level of protection of habitat used for feeding by Carnaby's Cockatoos. 	Implementation of the offsets package by project completion.	CALM, City of Canning, City of Cockburn, City of Melville, DPI, WAPC, Western Power, Public Transit Authority

No	Topic	Actions	Objectives	Timing	Advice From
12	Offset Areas	Have in place and make publicly available management plans for the offset areas (identified in Schedule 3) until these areas are appropriately transferred.	<p>Mitigate unavoidable impacts in respect of:</p> <ul style="list-style-type: none"> • viability of populations of the Grand Spider Orchid (<i>Caladenia huegelii</i>); • extent, quality, connectivity and level of protection of remnant Banksia woodland; • access of local residents and others to areas of natural bush; and • extent, quality and level of protection of habitat used for feeding by Carnaby's Cockatoos. 	Implementation by project completion.	CALM, City of Canning, City of Cockburn, City of Melville, DPI, WAPC, Western Power, Public Transit Authority
13	Fauna Management Plan	<p>Prepare a Fauna Management Plan that addresses all of the issues associated with design and construction as they pertain to the protection of local fauna, and to mitigation of impacts on local fauna populations. This will address:</p> <ol style="list-style-type: none"> 1. the link between the Fauna Management Plan and the Vegetation Management Plan; 2. fauna food plants to be incorporated in the revegetation; 3. design of fauna fencing; 4. design of underpasses for small fauna species, including any special revegetation requirements; 5. trapping and relocation of Quenda, including timing constraints; 	<ul style="list-style-type: none"> • Minimise impacts on the threatened fauna species. • Ensure that the population of kangaroos affected by the project is appropriately managed through consultation with the City of Melville, the Golf Course managers and CALM. 	Prior to construction.	CALM, City of Melville

No	Topic	Actions	Objectives	Timing	Advice From
		6. management requirements for Kangaroos during the construction period; 7. monitoring and maintenance requirements for the fauna fencing in the long term, and 8. monitoring requirements for the fauna underpass.			
14	Fauna Management Plan	Implement the approved Fauna Management Plan referred to in commitment 12.	Achieve the objectives of commitment 12.	During construction.	CALM
15	Pest and Disease Management Plan	Have in place and make publicly available a Pest and Disease Management Plan for incorporation in the construction EMP. This will address: 1. dieback cleandown requirements for entry onto the site and for internal movement of machinery and vehicles; 2. mechanism for treating small dieback infected areas; 3. disposal or burying of dieback infected soil; 4. selective clearing and topsoil harvesting to avoid retaining weedy material; 5. integration of all site works to achieve a dieback free site and to minimise the spread of weeds; and 6. landscaping will make use of species native to the area and will avoid use of aggressive introduced species that have the potential to become weeds.	<ul style="list-style-type: none"> • Protect the ecological integrity of remnant bushland within the MRS and of adjoining areas including Ken Hurst Park by preventing the spread of dieback and weeds. • Avoid introduction of aggressive plant species by selecting appropriate species, including species native to the project area, for use in revegetation and amenity plantings. • Contribute to the sustainability of remnant native vegetation within and adjacent to the MRS by supporting active weed eradication and dieback treatment programmes. 	Prior to construction.	CALM
16	Road Drainage Strategy	Design the Road Drainage Strategy in accordance with principles agreed with the DEP (including the WRC).	<ul style="list-style-type: none"> • Ensure no adverse impacts on the quality of the underground water supply. • Ensure no interference with 	Design phase (pre-construction).	WRC, CALM

No	Topic	Actions	Objectives	Timing	Advice From
			<p>quantity of water available to users of groundwater bores in the vicinity of the project.</p> <ul style="list-style-type: none"> Ensure no adverse impacts on the surrounding native vegetation. 		
17	Road Drainage Strategy	Implement the Road Drainage Strategy referred in commitment 16.	Achieve the objectives in commitment 15.	Construction.	WRC
18	Site Stormwater and Hazardous Materials Handling Management Plan	Have in place and make publicly available a Site Stormwater and Hazardous Materials Handling Management Plan to be incorporated in the project Construction EMP.	Achieve the objectives in 15 and 18..	Design phase (pre-construction).	WRC
19	Asbestos Waste Management Strategy	An Asbestos Waste Management Strategy will be developed and implemented in the event that disturbance of the emplaced asbestos is unavoidable.	Ensure no adverse impacts from asbestos.	Prior to construction.	DOH, City of Melville
20	Dewatering Management Plan	<p>Have in place and make publicly available a Dewatering Management Plan in the event that the need for dewatering cannot be avoided through design and operational management measures.</p> <p>Discharge water from dewatering operations (if any) will be utilised for construction purposes as practicable.</p>	Ensure no adverse impacts on the quality of the underground water supply.	Construction.	WRC, Water Corporation, City of Melville, City of Canning, City of Cockburn
21	Site Contamination-Soils Blending and Nursery Sites	Assessment for site contamination at the Soils Blending and Nursery Sites.	Ensure no adverse impacts on the quality of the underground water supply.	Prior to construction.	MRWA
22	Construction Traffic Management Plan	<p>Have in place and make publicly available a Construction Traffic Management Plan, to be incorporated in the construction EMP, addressing:</p> <p>1. designation and implementation of</p>	Minimise the effects of construction related traffic in adjoining areas.	Prior to construction.	MRWA

No	Topic	Actions	Objectives	Timing	Advice From
		<ul style="list-style-type: none"> “haulage” routes to service the Roe 7 project; 2. compliance with the applicable traffic laws; 3. minimising as practicable project-related heavy vehicle movements; 4. regular inspection of the designated haulage routes in the vicinity of the project area and implementation of appropriate remedial actions as may be necessary; 5. preparation and implementation of an Out of Hours Haulage Plan in the event that heavy haulage operations need to occur beyond normal business hours; and 6. implementation of a system for the receipt and response to any public complaints arising from the transport of construction-related materials. 			
23	Noise and Vibration Management Plan	<p>Develop a Noise and Vibration Management Plan as part of the construction EMP. addressing:</p> <ul style="list-style-type: none"> 1. alternatives to use of reversing alarms on mobile plant; 2. limit construction to normal business hours (7am to 7pm Monday to Saturday) as realistic and compatible with operational requirements; 2. carry out pre-construction condition surveys of residential premises in close proximity to the works area to enable assessment of any subsequent damage potentially associated with ground 	<ul style="list-style-type: none"> • Ensure that the amenity of adjacent residential areas is not significantly impacted by either noise or vibration from construction of the highway. • Limit the noise and vibration experienced on sites neighbouring the project area during highway construction. 	Design phase (pre-construction)	City of Canning, City of Melville and City of Cockburn

No	Topic	Actions	Objectives	Timing	Advice From
		vibration; 3. maximise separation between potentially noisy/vibration inducing activities and nearby residential areas as practicable and consistent with operational requirements. 4. adopt construction techniques that will minimise the vibration experienced at residential premises in close proximity to the works area; 5. install noise protection barriers as early as practicable in the construction programme to reduce the noise experienced by residents; and 6. provide a timely and effective system for recording and responding to noise complaints.			
24	Noise and Vibration Management Plan	Implement the Noise and Vibration Management Plan outlined in commitment 22.	Achieve the objectives of commitment 22.	Construction.	City of Canning, City of Melville and City of Cockburn
25	Traffic Noise	Provide noise attenuation barriers so that residential or other noise sensitive premises adjacent to the alignment do not exceed the base level criteria of 63 dB(A) for day time noise levels and 55 dB(A) for night time noise.	Ensure that the amenity of adjacent residential areas is not significantly impacted by noise from operation of the highway.	Prior to Construction.	MRWA, City of Canning, City of Melville and City of Cockburn
26	Traffic Noise	Noise levels will be measured after opening of the highway extension, and any non compliances where the measured noise levels do not comply with the base level criteria will be rectified.	Ensure that the amenity of adjacent residential areas is not significantly impacted by noise from operation of the highway.	Post construction.	MRWA, City of Canning, City of Melville and City of Cockburn
27	Traffic Noise Investigations	Identify a “best practice” approach to traffic noise mitigation (based on noise modelling already undertaken) in consultation with the	Ensure that the amenity of adjacent residential areas is not significantly impacted by either noise from	Prior to construction.	MRWA, City of Canning, City of Melville and City of

No	Topic	Actions	Objectives	Timing	Advice From
		DEP.	construction or from operation of the highway.		Cockburn
28	Traffic Noise Investigations	Implement the appropriate further investigations required by the outcome of commitment 26.	Ensure that the amenity of adjacent residential areas is not significantly impacted by noise or from operation of the highway.	Prior to construction.	MRWA, City of Canning, City of Melville and City of Cockburn
29	Access to Ken Hurst Park	Provide safe access to Ken Hurst Park. This will involve continued liaison with the Community Reference Group, to determine the most suitable location and form of access.	<ul style="list-style-type: none"> • Ensure the safety of residents is taken into account in the provision of cycling and walking facilities. • Provide access to Ken Hurst Park from residential / recreational areas on the north of the highway. 	Design phase.	City of Canning, City of Melville
30	Construction Related Dust	Have in place and make publicly available a Dust Management Plan, to be incorporated within the construction EMP, that addresses the potential for dust and wind blown sand. Management actions are to include: 1. daily monitoring of levels of dust and windblown sand during construction; and 2. the dampening down of all work areas to ameliorate unacceptable levels.	<ul style="list-style-type: none"> • Ensure new cut and fill embankments are rapidly stabilised, and are not subject to excessive wind or water erosion. • Minimise the impacts on local air quality, and the nuisance aspects from windblown sand and dust. 	Prior to construction.	City of Canning, City of Melville and City of Cockburn.
31	Construction Related Dust	Provide rapid stabilisation of disturbed areas or new embankments through timely and progressive mulching and revegetation.	Achieve the objectives of commitment 29.	Construction	MRWA
32	Construction Related Dust	Monitor stability of finished works, and rectify any problem areas for the duration of the two year defects liability period.	Achieve the objectives of commitment 29.	Post construction	MRWA
33	Management Visual Impacts	Minimisation of the visual prominence of the road formation and associated structures as practicable and consistent with operational and safety considerations through:	Ensure that visual amenity of the area is not significantly affected by implementation of the proposal.	Prior to construction.	City of Melville City of Canning City of Cockburn

No	Topic	Actions	Objectives	Timing	Advice From
		<ol style="list-style-type: none"> 1. design measures (eg relating to physical dimensions, shape and colour of the formation and associated structures); 2. landscaping and rehabilitation planting programmes; and 3. minimisation of the risk of light spill into adjacent residential areas from route and PSP illumination as practicable and consistent with relevant standards and operational and safety considerations. 			
34	Management of Access Severance	<p>Facilitation of access within the corridor accommodating the Roe 7 extension through the following:</p> <ol style="list-style-type: none"> 1. establishment of a continuous PSP along the northern side of the route and connection of this path to the existing local Principal Shared Path network; 2. provision for north-south movement across the route at Karel Avenue; and 3. consultation with the Cities of Canning and Melville regarding the provision of formal access to Ken Hurst Park. 	<ul style="list-style-type: none"> • Ensure that the safety of residents is taken into account in provision of cycling and walking facilities. • Facilitation of access within the corridor. 	Prior to construction.	City of Melville City of Canning City of Cockburn
35	Residential amenity.	<p>Minimisation of other impacts on residential amenity through:</p> <ol style="list-style-type: none"> 1. maximisation of the separation between the Principal Shared Path along the northern side of the proposed route and adjoining residential properties as practicable; 2. establishment of screen walls and landscaping between the Principal Shared Path and adjoining residential properties. 	Ensure that the safety of residents is taken into account in provision of cycling and walking facilities.	Prior to construction.	City of Melville City of Canning City of Cockburn

Key:

CALM	Department of Conservation and Land Management
DEH	Commonwealth Department of the Environment and Heritage
DOH	Department of Health
DPI	Department of Planning and Infrastructure
F of KHP	Friends of Ken Hurst Park
BGPA	Botanic Gardens and Parks Authority
WAPC	Western Australian Planning Commission
WRC	Water and Rivers Commission
WAOSG	Western Australian Orchid Society Group

**Summary of Key Characteristics of Proponent's Mitigation
and Offset Strategy**

May 2004

**Roe Highway Stage 7 Extension (South Street in
Canning Vale to Kwinana Freeway in Leeming)**

1. Engineering Design Modifications – avoidance of environmental impacts

Table 1. Engineering design modifications

Action	Effect
Reduce the median width between South St and John Connell Reserve by approximately 4.5m over a distance of approximately 1300m.	Reduction in clearing of native vegetation. Disturbance footprint reduced by approximately 5850 m ² .
Additional reduction in median width (4.5m reduction) over approximately 4000 m length of road.	Reduction in clearing of native vegetation. Disturbance footprint reduced by approximately 18000 m ² .
Combine the direct loop and semi direct loop ramps together and increase the median width (by 200mm). Relocate the shoulders to the median side for the loop and semi direct loop ramps.	Reduction in clearing of native vegetation. Reduces the amount of clearing by combining batters. Increases safety by providing better sight distance and providing amore forgiving driving environment. Also allows the PSP to be placed close to the road embankment. Estimated reduction in clearing of vegetation is 1500 m ² .
Construct the Principal Shared Path (PSP) adjacent to road shoulder wherever possible through residential areas rather than adjacent to the residential properties.	More effective noise control. Reduced visual impact. Reduced habitat fragmentation. Reduction in clearing of native vegetation. Allows noise barriers to be located closer to noise source, so that barriers will be more effective and less visually intrusive. This also minimises the impact on residents immediately adjacent the Highway as it minimises the construction work next to their boundaries. Estimated reduction in clearing is approximately 7000m ² . It is noted that not all of the reduction occurs in excellent quality bush, as the vegetation in proximity to residential properties has suffered varying degrees of disturbance.
Place the vertical road alignment as close as possible to the existing ground level through the area where Declared Rare Flora is found, to minimise the batter widths and thus reduce the amount of clearing.	Reduction in clearing of native vegetation. Avoidance of DRF. The approximate reduction in the disturbance footprint is 6000m ² .
Adopt more stringent construction control to reduce works envelope to 1m buffer, instead of 3m clearing envelope conventionally used by Main Roads. Stockpile fill, mulch, topsoil and other materials outside road reserve, to minimise disturbance to native vegetation.	Reduction in clearing / disturbance of native vegetation. The approximate area of reduction in disturbance to vegetation achieved by stockpiling materials outside the road reserve is 20,000 m ² . Approximate cost - \$300,000
Adopt northern alignment for portion of highway south of John Connell Reserve.	Reduction in clearing of good quality native vegetation. Avoidance of DRF. Disturbance occurs in more degraded areas of bush. Estimated reduction in number of orchids directly impacted is about 20. Approximate cost - \$500,000
Where ground elevations permit, retain vegetation in areas proposed for infiltration of storm water runoff.	Reduction in clearing of native vegetation. Approximate extent of undisturbed infiltration basins is 11,400 m ² .

2. Impact Reduction Measures

Table 2. Impact reduction measures (operational and management controls)

Action	Effects
Where earthworks are required to provide sufficient storage capacity for infiltration of runoff, basins will be revegetated using dampland species of local provenance. Once established, these areas should provide similar ecosystem functions to those of naturally occurring damplands. Minimise alterations in pre-construction hydrology by implementing Drainage Management Strategy.	Maintenance of ecological function. Minimise risk of altered hydrology affecting remnant vegetation or DRF. Approximate extent of recreated damplands is 29,000m ² .
Negotiate access for haulage and construction traffic along rail service corridor.	Reduced impact on Residential Amenity. Reduces the need for construction vehicle movements through residential streets. The resulting reduction in traffic is expected to be of the order of 50 trucks per day over a nominal 12 week construction period.
Schedule construction works to avoid ground disturbance during orchid flowering period. (Requires segregation of orchid habitat and double handling of some earthen materials.)	Allows salvage of DRF. Allows for salvage and translocation of <i>Caladenia huegelii</i> . Approximate cost - \$100,000
Conduct additional spring surveys to locate <i>Caladenia huegelii</i> and translocate plants likely to be directly impacted by construction works, in accordance with research methodology outlined in the <i>Caladenia huegelii</i> Conservation and Management Plan.	Allows salvage of DRF. Contributes to knowledge of <i>Caladenia huegelii</i> biology. The translocation will be carried out as a controlled experiment to enable rigorous assessment of the factors influencing success of translocation. This knowledge will be important when transplanting plants grown in the laboratory and glass house to selected field sites. Approximate cost - \$32,000
Adopt landscape design incorporating local species, including seed and other propagules from local area. Where possible, salvage mature tree species and reuse. Use any surplus plants or propagules for bush regeneration. Provide maintenance and monitor success of landscaped areas. Avoid planting of food species in close proximity to carriageway to minimise risk of road kill.	Maintain or restore habitat (including food source) for fauna. Contribute to project aesthetics. The landscaping will rehabilitate approximately 30 ha of the land disturbed during highway construction. About 10 ha of the landscaped area will involve plantings which seek to emulate the banksias woodland system that currently exist in the area. The proposed landscaping design includes establishment of approximately 6000 <i>Banksia</i> trees (of local species and local provenance), which when mature, will provide food to support a population of approximately 25 cockatoos (assumes a 4 month long feeding season). Approximate cost - \$1,265,000
Selectively clear and stockpile topsoil and mulch from construction footprint to prevent spread of dieback or weeds in project area. Dispose of weedy or dieback affected materials to appropriate landfills. Carry out	Protection of remnant vegetation. Preventing the spread of dieback and weeds is critical to the protection of Ken Hurst Park and other areas of remnant bush adjoining the road reserve.

Action	Effects
weed control and die back protection following construction, in accordance with the project Vegetation Management Plan.	Approximate cost - \$55,000
Develop and implement Fauna Management Plan. Provide appropriate fencing to exclude animals from highway. Trap and relocate quendas prior to ground disturbance in order to minimise fauna deaths. Provide fauna underpasses to allow movement of small fauna beneath highway. Monitor animal movements and recolonisation of rehabilitated areas.	Minimise harm to fauna during and after construction. The management plan provides for excluding animals from areas prior to disturbance (to minimize trauma and injury to fauna. Permanent fencing will be provided to prevent access of kangaroos and other macrofauna to the roadway. The plan also includes provision for small fauna connections to allow movement across (beneath) the highway. Funds are provided to monitor the success of the Fauna Management Plan. Approximate cost - \$70,000
Develop and implement Noise Management Plan. Provide noise barriers to ensure compliance with Noise Regulations. Monitor effectiveness of noise control measures.	Control noise impacts. Approximate cost - \$2,000,000.
Develop and implement Construction Environmental Management Plan.	Ensure compliance with project and regulatory requirements. Provides basis for enforcement or corrective actions.

3. Environmental Offsets

Table 3. Summary of offsets to address unavoidable project impacts.

Offset	Benefit
<p>Place covenant approximately 4.5 ha of land near Fern Leaf Court and place into conservation estate. Transfer land from Commissioner for Main Roads to a Class A Crown Reserve, vested in the City of Melville, and included as part of John Connell Reserve.</p> <ul style="list-style-type: none"> Land is not currently included in any Bush Forever site. Current zoning is “Parks & Recreation”. <i>Caladenia huegelii</i> is known to occur on land (approximately 13 plants) and on adjoining Unallocated Crown Land to the north (approximately 16 plants). Bandicoots (quenda) reported to occur in area. <p><i>Land corresponds to parcel A shown in Figure 1.</i></p>	<p>DRF offset. Protects known population of <i>Caladenia huegelii</i> (in the order of 20 plants). Population was discovered during Roe 7 surveys of area in 2003.</p> <p>Habitat offset. Preserves good quality habitat for quendas and other small fauna currently residing in area. Protects banksias woodland used for feeding by Carnaby’s Cockatoos.</p> <p>Remnant vegetation. Provides publicly accessible area of good quality vegetation for nature study and enjoyment by local residents.</p> <p>Approximate value \$1,000,000</p>
<p>Land rationalisation to allow approximately ~4.7 ha of Main Roads land south of Roe 7 to be incorporated into Ken Hurst Park. Transfer ownership to a Class A Crown Reserve to be managed as part of Ken Hurst Park.</p> <p><i>Land corresponds to parcel B shown in Figure 1.</i></p>	<p>Habitat / remnant vegetation offset. Increases area of good quality remnant vegetation within Bush Forever site. Fencing provided by Main Roads will help control access to protected bushland, reducing damage from trail bikes, motor vehicles, etc.</p> <p>Approximate value \$500,000</p>

Offset	Benefit
<p>Land rationalisation of approximately 6.3 hectares of land currently owned by Commissioner of Main Roads to allow incorporation into Ken Hurst Park. Transfer ownership to a Class A Crown Reserve to be managed as part of Ken Hurst park.</p> <p><i>Land corresponds to parcel C shown in Figure 1 (estimated conservation area excludes land potentially affected by use for drainage infiltration).</i></p>	<p>Habitat / remnant vegetation offset. Increases area of good quality remnant vegetation within Bush Forever site. Helps maintain east-west bush corridor.</p> <p>Preserves good quality Banksia woodland used for feeding by Carnaby's cockatoos.</p> <p><i>Approximate value \$500,000</i></p>
<p>Land rationalisation and covenanting of approximately 6.5 hectares of land currently owned by Commissioner of Main Roads and land owned or vested in Western Power or transfer to Crown Land vested in an appropriate management agency.</p> <p><i>Land corresponds to parcel D shown in Figure 1.</i></p>	<p>Habitat / remnant vegetation offset. Increases area of good quality remnant vegetation preserved for conservation purposes.</p> <p>Preserves good quality Banksia woodland used for feeding by Carnaby's cockatoos.</p> <p><i>Approximate value \$2,000,000</i></p>
<p>Place covenant over an area of approximately 5.1 ha of remnant bushland in the vicinity of the Roe 7/Kwinana Freeway interchange.</p> <p><i>Land corresponds to parcel E shown in Figure 1.</i></p>	<p>Habitat / remnant vegetation offset. Increases area of good quality remnant vegetation managed for conservation purposes.</p> <p>Preserves good quality Banksia woodland used for feeding by Carnaby's cockatoos.</p> <p><i>Approximate value \$1,000,000</i></p>
<p>Contribution (funding and in-kind) for restoration of degraded areas in road reserve or in adjoining bush areas.</p>	<p>Remnant vegetation offset. Allows revegetation and other restoration works to improve condition of ~5 ha bush in proximity to Roe 7 highway.</p> <p><i>\$190,000 (does not include value of in-kind support, eg. seed, mulch etc.).</i></p>
<p>Contribute to orchid research by Kings Park Botanical Gardens (genetic research into <i>Caladenia huegelii</i> propagation).</p>	<p>DRF offset. Aims to increase viability of threatened species through 5-year programme of targeted genetic and ecological research to enable successful <i>ex-situ</i> conservation of <i>Caladenia huegelii</i>. Includes research into pollinators and symbionts of <i>Caladenia huegelii</i> (to complement translocation efforts.)</p> <p><i>\$192,000</i></p>
<p>Matching funding to City of Melville for implementation of Ken Hurst Park Management Plan.</p>	<p>Remnant vegetation offset. Supports protection of near pristine remnant vegetation, including DRF, by providing funds to allow fencing of the park, limit access to designated paths, provide dieback control, weed control, etc. Consistent with established park management plan (Sept 2003).</p>

Offset	Benefit
	\$10,000
Provision of connectivity to Ken Hurst Park through either contribution to upgrade of access track running parallel to rail services road (between Karel Ave and Bannister Road) or pedestrian underpass.	Connectivity offset. Improves access to Ken Hurst Park for bush maintenance and fire fighting, thereby reducing risk of vegetation decline. \$200,000
In-kind support to City of Melville for use in Perth Biodiversity Initiatives, including environmental education initiatives.	DRF / remnant vegetation offset. Helps raise local awareness of the value of native vegetation and DRF. Provides support for protection of locally significant vegetation. \$10,000
Contribution towards securing of “at risk” population of <i>Caladenia huegelii</i> on parcel of land at Gay St and Warton Road, Huntingdale (or towards securing equivalent natural values).	DRF offset. \$__ To be arranged

Abbreviations:

DRF = Declared Rare Flora

Appendix 6

Addendum (on CD) to the PER

- **Summary of submissions and proponent's response to submissions**
- **Mitigation and Offset Strategy**
- **Air Quality**
 - **Independent Review of Air Quality Impact Assessment**
 - **Regional Air Quality Study**
- **Independent Review of Noise Impact Assessments**
- **Draft *Caladenia huegelii* Conservation and Management Plan**